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'Cool' Convention May Help Select 'Right' Candidate

By Phil B. Redeker

LOS ANGELES — "Once the delegates are assembled in the convention city they must be transported from hotels to convention hall, and there protected from heat prostration, famine, dehydration, incineration, and other perils that would keep them from completing their noble mission."

So stated a recent feature article in the public press, relevant to the upcoming Presidential nominating conventions of the Democratic Party (starting July 11 at the Memorial Sports Arena in Los Angeles) and the

(Continued on Page 31, Col. 1)

Educators Discuss Cooling's Effect On Learning

By George F. Taubeneck

NEW YORK CITY — Trumpeteering for school air conditioning by the NEWS and its younger brother publication, AIR ENGINEERING, has clarioned its values to taxpayers and the air conditioning industry.

Carrier Corp. muted these strident trumpets, and brought the flute-and-piccolo section to the forefront, in its "Improving the learning Environment Seminar" here last week.

Emphasis of this seminar was the effects of air conditioning upon students, teachers, and the entire "learning process."

After Carrier's Bill Lane (who looks and talks like a Senator from New Hampshire, but isn't) welcomed the grumpy-morning assemblage, Dr. William Flesher of Ohio State university took charge.

Dr. Flesher, a witty fellow, led with his ace—Mrs. Eva McDonald, a gorgeous brunette with a flashing smile who somehow got dragooned into the Alton, Ill., public school system.

"I became interested in the effect of classroom environment when I learned that the Eunice

(Continued on Page 10, Col. 1)

Inside Dope

By GEORGE F. TAUBENECK

Learn to live and laugh — thus delay your epitaph

Mighty Manhattan

New York City nowadays affords a stupendous spectacle to visitors. "The show" consists of a rebuilding, remodeling, redevelopment program which cannot be imagined unless it is seen.

Nowhere in the world, *ever*, has there been anything like the big building boom which is occurring there. To a man who visits New York only three or four times a year it's especially astonishing.

Construction currently under way in The Big Town totals nearly eight billion dollars in value! And (back to our infrequent visitor) it's going on all the time. Whole new blocks of skyscrapers appear almost like magic.

Rome may not have been built in a day, but sections of Manhattan are.

All this busting-out-all-over here isn't a temporary flash or wink. From the suburbs people are emigrating back to the city's heart in droves.

Couples whose children are grown, plus middle and higher-income families who seek Manhattan excitement, continually plead for more high-rise apartment structures.

Manhattan has become a Status Symbol for giant corporations, too. Their new skyscrapers are their monuments—like the Pyramids were for Pharaohs.

What a city! What a building boom! What an air conditioning market!

Looking Up

When Mrs. Jenney dropped her book on a bird cage 75 years ago she didn't realize she was laying the cornerstone for . . . well, for example . . . the gleaming 52-story tower of glass and stainless steel which stands on Manhattan's bedrock at Park Ave. and 47th St.

Colonel William Le Baron Jenney returned from his construction job a little early one day in 1883, and surprised his wife. Jumping up to greet her husband, she dropped her book on the bird cage. In a split second Colonel Jenney's nimble

(Continued on Page 16, Col. 1)

Air Conditioning Sales Picture

Mfrs. Volume Heads Towards New Highs; Retail Sales Vary by Product and Area

Unitary Models In Fair Gain, Room Unit Retail Sales Lag In Some Areas Where Cool Weather Stays

DETROIT — As the calendar year 1960 passes the half-way mark, it seems certain that manufacturers' sales of air conditioning equipment in all categories will be near record-breaking highs.

On retail sales, the verdict is still out, with the consensus seeming to be that a good showing in July and August in the metropolitan centers in the north and on both coasts will be needed to bring sales close to the more optimistic forecasts.

How inventories will stand at the close of the "air conditioning year" (Aug. 31) will depend considerably on sales performance between now and that date. As of the end of May manufacturer and distributor inventories of room air conditioners and unitary air conditioners, according to best available figures, were greater than those at the same time last year, although not alarmingly so.

Manufacturers' sales of unitary air conditioners for the first five months of 1960 showed an increase over the same period of 1959 of between 15 and 20%, according to the best available figures. While this was not as

(Continued on Page 41, Col. 1)

Frick Outlines Plan to Broaden Product Lines, Promotion

By Phil B. Redeker

WAYNESBORO, Pa. — A "new and progressive atmosphere" as President W. H. Aubrey terms it is shaping up at the Frick Co. here. Its approach to the air conditioning and refrigeration market is being strengthened with new and improved products, and more vigorous promotion of its concept of providing and being responsible for the complete system.

One of the oldest firms in the industry, Frick became a wholly-owned subsidiary of General Waterworks Co. late in 1959. Relations with the parent company are through John M. Seabrook, its vice president, manufacturing, now chairman of the board of Frick. Moves were then started by Seabrook and Aubrey to:

1) Expand and strengthen the executive and field sales personnel.

2) Broaden and improve the company's line of air conditioning and refrigeration products.

3) Develop a more aggressive advertising and sales promotion program aimed at making prospective purchasers conscious of what Frick has to

(Continued on Page 4, Col. 1)

Strike Hits NYC Air Conditioning

NEW YORK CITY — Large air conditioning installations in New York City may be held up for as much as a month by the strike called by sheet metal workers, steamfitters, and insulation installers on July 1, in the opinion of some air conditioning contractors.

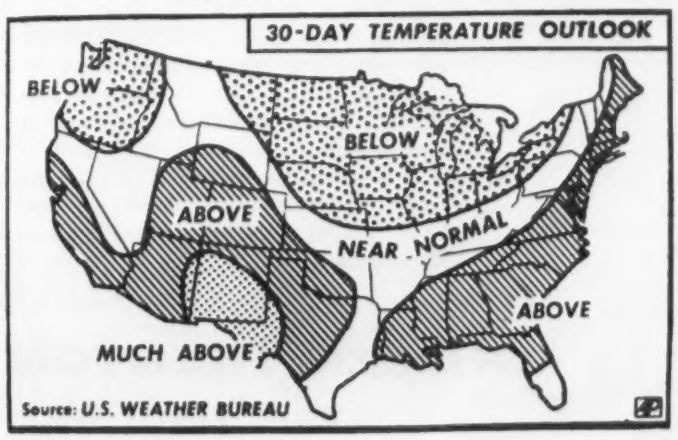
Tie-up will affect all work done by union labor, which in-

(Continued on Back Page, Col. 1)

How Weather Bureau Sees July

WASHINGTON, D. C. — "Temperatures to average above seasonal normals in the southern half of the country and also along the Atlantic Coast. Below normal averages are predicted over the Great Lakes Region, the Northern Plains, and the Pacific Northwest."

That's the official U. S. Weather Bureau long-range outlook for July. A look at the chart on predicted temperatures will prevail through most of California, and "much above normal" temperatures are expected in parts of the southwest. The chart on predicted precipitation calls for heavy rainfall in the Great Lakes and part of the Plains areas, which could mean muggy conditions.



New Orleans Contractors Postpone 'Vacation' Again

NEW ORLEANS—Air conditioning contractors here have delayed for another 15 days an industry-wide "vacation" protest against the city council's refusal to adopt a licensing law.

Philip J. Thompson, president of two Louisiana air conditioning and refrigeration trades associations, said the postponement was accepted at a meeting of his groups and a third trade association in the area.

Starting date of the mass walkout was put off until July 15, he said, in answer to requests from individual councilmen.

This was the second delay announced by New Orleans area contractors. Originally, the walkout was to start June 1, but was postponed at that time so they could fulfill their previous June commitments.

Contractors in the New Orleans metropolitan area normally receive an average of 2,500 service calls a day during the summer months, it was pointed out. Because an estimated 90% of all contractors are expected to participate in the "vacation," almost all of these maintenance and repair calls would go unanswered, it was claimed.

The ordinance was first presented to the council last October and was taken under advisement in February. It has been vigorously opposed by several labor unions and this is believed to be the reason for delay.

Thompson is president of the Master Refrigeration & Air Conditioning Association and the Louisiana Refrigeration & Air Conditioning Contractors Inc. The third group supporting the licensing law is the Air Conditioning & Refrigeration Trades Association of Louisiana, headed by Ralph Tebbe.

Spirduso Steps Up To Trane Ad Manager

LA CROSSE, Wis. — Donald F. Spirduso, 28, has been promoted to advertising manager of The Trane Co., it was announced by Vice President A. C. Menke.

Spirduso, formerly assistant advertising manager, has been with Trane since December, 1956. Besides his administrative duties, he has worked on Trane national advertising in liaison with Campbell-Mithun, the company's advertising agency.

Qualified G-E Dealers Can Have Servicing Franchise If Wanted

LOUISVILLE, Ky. — General Electric retailers who want to service appliances and who can meet required standards of product service performance will be franchised as servicing dealers, according to an announcement from the company's Major Appliance Div. Sales and Distribution Dept.

The need for centralized service remains, R. C. Hawley, Dept. general manager, explained. But, he added, it is now a matter of Dept. policy that qualified retailers receive servicing franchises if wanted, regardless of the territory.

"We have simply formalized in national policy the practice of most of our distributors.

"The distributor has always had the responsibility of running his business, and he still does," Hawley explained. "Distributors have discharged their service responsibilities by establishing centralized metropolitan service and by franchising independent servicing agencies and servicing dealers.

"Most franchised dealers outside the metropolitan service area are servicing dealers—and will probably continue to be so. But in practically every market qualified dealers within the metropolitan area who wanted service franchises have received them. This has been at distributor option; now it is a matter of policy.

"As a matter of fact, the service responsibility for more than 60% of all General Electric major appliances rests with servicing dealers and authorized servicing agencies," Hawley said.

"Most metropolitan dealers welcome centralized service, but we recognize that there are also some dealers who feel that providing service to their customers is an aid to their sales," Hawley explained. "We also recognize that a variety of servicing agencies not only offers the customer a choice, but establishes a healthy competitive atmosphere which can only result in greater customer benefits."

A policy letter to distributors points out that customer satisfaction is the real goal of all service operations because satisfied customers become repeat buyers. The letter also recognizes that centralized service, independent agencies, and servicing dealers are all needed to do the job under varying market conditions.

District managers of the Sales and Distribution Dept. and independent distributors will set the standards to be met by dealers seeking service franchises, the letter explains. Such standards will be identical to those established for the distributors' own centralized service. They will require continuity in service personnel, regular attendance at technical and training meetings, adequate parts stock, and the ability to handle service calls quickly.

General Electric major appliances are distributed by 26 Sales & Distribution districts and 13 independent distributors, Hawley explained.

Regardless of the number of servicing dealers franchised, the need for distributor, or centralized, service will remain, Hawley declared.

"Only through such service can adequate manpower be recruited and trained, especially to meet long term requirements," it was stated. "This also has proven to be the best way for the company to secure prompt and authentic information on new models and honor its guarantees in situations where dealers who sold appliances can no longer provide service or where customers have moved from the place they bought their appliances."

no place in the U. S. A. is too hot for the KRAMER

UNICON-COMPRESSOR

(and no place is too cold, either)

Yes . . . it is true! Kramer's UNICON-COMPRESSOR (packaged air-cooled condensing unit) can operate any place in the United States the year 'round. With the patented Kramer Winterstat, it operates without adjustments in the dead of winter—when cooling and dehumidification are necessities. Combined with the matching Kramer Air Conditioning Unit, a complete system can be yours from one source.

Light and compact, Kramer's UNICON-COMPRESSOR arrives on the job completely assembled, wired, tested and factory run-in . . . ready to operate.

There's a Kramer system for any size job, too! Available in 3 to 70 tons, multiple use provides unlimited tonnage application. And you can specify a vertical or waist-high horizontal face UNICON-COMPRESSOR.

WRITE FOR BULLETIN

KRAMER TRENTON CO., Trenton 5, N. J.

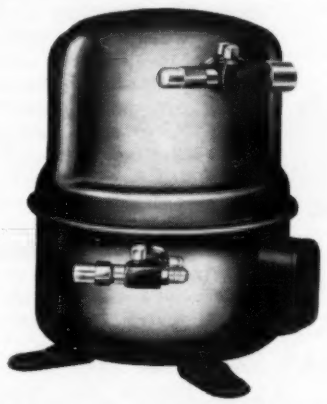
47 YEARS OF CONTINUOUS ACHIEVEMENT IN HEAT TRANSFER

Compact, quiet and economy-priced Welded Motor-Compressors

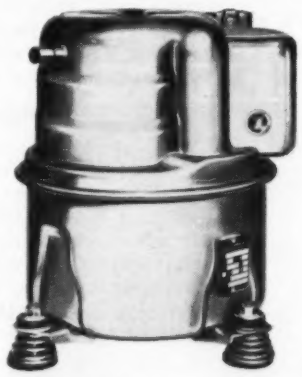
Accessible, Welded or Belt-Driven . . . Copeland has what it takes!

for room air conditioners...residential and commercial air conditioners...heat pumps...freezers...refrigerators...vending machines...beverage coolers...water coolers

COPELAWELD hermetics ⅛ H.P. through 4 H.P.



Copelaweld 4-cylinder models ...2½, 3, 3½ and 4 H.P.



Copelaweld 2-cylinder models ...½, ¾, 1, 1½ and 2 H.P.

Copelaweld Space Savers ...⅛ H.P. through ⅓ H.P.

Day in and day out, Copelaweld motor-compressors are quietly going about the business of making both manufacturers and users happy. These welded hermetics perform with smooth, quiet efficiency . . . deliver high output per watt-hour of power . . . give long, trouble-free service.

The best way . . . the most economical way . . . to insure customer satisfaction is to equip your product with Copelaweld welded hermetics. Consider Copelaweld for *all* your welded applications . . . now through 4 H.P.

For complete specifications and performance data, request form numbers 6018 and 5909. For Copelaweld condensing units, ⅛ H.P. through ⅓ H.P., form number 6017.

Listed below are representative specifications for each horsepower range. Many more models are available, designed to meet individual requirements.

Copelaweld ⅛ H.P. through 4 H.P. SPECIFICATIONS

Model	H.P.	Cyls.	Bore	Stroke	C.F.H. Displ.	RPM	Suct. Valve	Disch. Valve	Refrig.	Oil Charge	Net Wgt.	Ship Wgt.	Capacity BTU/HR
CF-18S	⅛	1	1.075″	.625″	34.3	1750	5/16″	¼″	R-12	30 oz	24	28	818
CF-20S	⅕	1	1.288″	.625″	49.2	1750	5/16″	¼″	R-12	30 oz	25	29	1120
CF-25S	¼	1	1.175″	.625″	81.0	3500	3/8″	5/16″	R-12	28 oz	31	35	1890
CF-33S	⅓	1	1.288″	.625″	97.0	3500	3/8″	5/16″	R-12	28 oz	32	36	2340
UF5-50	½	2	1 1/32″	15/16″	95.2	1750	3/8″	3/8″	R-22	48 oz	58	63	5100
UD7-75	¾	2	1 7/32″	15/16″	132.8	1750	½″	3/8″	R-22	48 oz	64	69	7850
UH9-100	1	2	1½″	15/16″	202.0	1750	½″	3/8″	R-22	48 oz	65	70	13350
UJ10-150	1½	2	1 31/32″	15/16″	245.0	1750	5/8″	3/8″	R-22	48 oz	70	75	16600
USS11-200	2	2	1 13/16″	1 1/32″	324.0	1750	¾″	3/8″	R-22	48 oz	72	77	22650
4U16-252	2½	4	1½″	1 1/32″	443.0	1750	7/8″	5/8″	R-22	105 oz	125	134	28900
4U18-302	3	4	1 5/16″	1 1/32″	481.0	1750	1⅛″	5/8″	R-22	105 oz	125	134	32700
4U22-352	3½	4	1 13/16″	1 1/32″	561.0	1750	1⅛″	5/8″	R-22	105 oz	136	146	39400
4U26-402	4	4	1 13/16″	1 1/32″	647.0	1750	1⅛″	5/8″	R-22	105 oz	136	146	44800

NOTE: ⅛ H.P. through ⅓ H.P. capacity at 15° F. Evaporating Temperature, 120° F. Condensing Temperature.
½ H.P. through 4 H.P. at 45° F. Evaporating Temperature, 130° F. Condensing Temperature. 65° F. return gas and no liquid subcooling.

SINCE 1918

Copeland REFRIGERATION CORPORATION, Sidney, Ohio

Manufacturers of performance-proved motor-compressors and condensing units for air conditioning and refrigeration

Frick Outlines Plans--

(Continued from Page 1, Col. 4)

offer and its philosophy of doing business.

The major move towards strengthening the executive team was the appointment of Matthew M. Gouger as executive vice president (reported in the June 6 issue of the NEWS). He has held executive posts with General Aniline & Film Corp., Glenn L. Martin Co., Trans-World Airlines, Pittsburgh Plate Glass Co., and U. S. Steel Corp.

David J. Wood, who has been assistant sales manager of Frick and active in its work with distributors, has been appointed manager of market planning. He is a graduate mechanical engineer with over 20 years' experience in the cooling field. Weston G. Strauch joins the staff as application engineer on air conditioning. He had been working with O. E. Lewis Co., Frick New Orleans distributor, as a sales engineer. W. F. Weir has been named director of manufacturing planning.

New treasurer and controller of the company is John R. Kiessling, formerly with Seabrook Farms.

Herbert L. Zeger has been named manager of budgetary controls. He was formerly with Fairchild Aircraft. Arthur W. Bell has been appointed director of industrial relations, having been formerly in such work with Vertol Aircraft and Pacific Airmotive Corp.

In the field organization John R. Michie has been named manager of Frick of Canada Ltd., subsidiary recently opened in Montreal. He had been with Canadian Ice Machine Co., Ltd. since 1940. Allan J. Beverley took over as regional manager of the Frick Boston office, succeeding the late Robert S. Ziehmn. Beverley has been with Canadian Ice Machine Co.

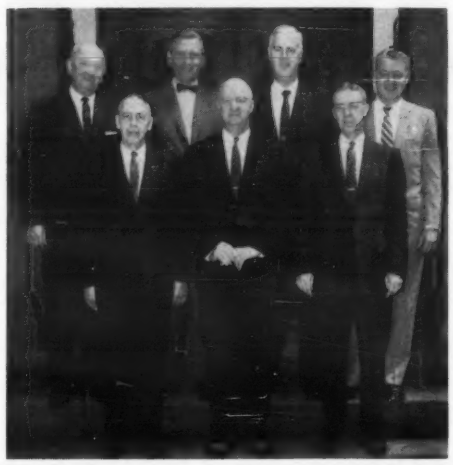
Named as regional manager with a territory from California to Alaska is Alan Vandermade, who has been with Frick for some years and will continue to make his headquarters in Palo Alto, Calif. Definite plans have been made to increase branch office staffs, and possibly also the number of "factors," as Frick calls the independent installing contractors who handle the Frick line.

To Strengthen Exports

Frick products have always had a good market abroad, Aubrey stated, and efforts are being directed to strengthen this position. E. K. Kofod, who has been assistant chief estimator, will become manager of the Frick branch office in Singapore.

Just returned from a trip around the world, Joaquin Alvarez, manager of export sales, reported increasing sales, especially in the Near East, Far East, and in the inhabited islands of the South Pacific.

The Frick distributor in Greece, E. Christopoulos & Son, Inc., holds the distinction of the handling of the Frick line longer than any other foreign distributor, having represented the company for more than 50 years.



TOP MANAGEMENT TEAM at Frick Co. which is proceeding with plans to broaden company's line of products, and to step up promotion programs. Front row, l. to r.: M. W. Garland, vice president, engineering; W. H. Aubrey, president; M. B. Watts, secretary. Back row, l. to r.: M. M. Gouger, executive vice president; J. M. Seabrook, chairman of the board; J. R. Kiessling, treasurer; A. E. Roschli, senior vice president.

In the expansion of its product line, Frick will add a line of air-cooled condensers, a line of forced-draft cooling towers, and will expand and improve its line of evaporative condensers. Aubrey also indicated that plans are on the boards for a new type of compressor.

A weather proofed unit that simplifies field applications and housing has been provided for the shell ice-maker, which has been a good moving item. Plans are being developed for packaging some equipment in the line for industrial heat pump applications, there having already been some applications along this line in the citrus fruit juice concentrate field.

To implement its plans to "present our new image to the world" and to emphasize those policies of doing business which it considers unique, Frick has assigned its advertising to Lewis & Gilman, Philadelphia advertising agency, with John Belfield servicing the account.

Two Major Sales Points

"There are two areas of policy in which we think Frick has something different to offer, and we plan to emphasize these in our advertising to the trade, and to prospective purchasers of equipment," Aubrey states.

"First, the distribution of our products is such that when a factor bids on a job, he knows that any costs he incurs—engineering costs in particular—will be protected. In other words, when a factor goes through all the work of laying out and bidding a job, he doesn't worry about someone else coming along and offering the same equipment.

"Secondly, when we contract to install our air conditioning or refrigeration systems, we accept complete responsibility. We guarantee that by written contract; no excuses, no alibis, no putting the blame on any component manufacturer.

"This matter of taking responsibility for a job is a major problem facing the industry today although there are many who apparently do not realize it. Some of the industry's largest and important customers are expressing concern about failures that occur where components are not properly related and where no one takes complete responsibility for the system—the whole industry will soon awaken to this."

SPORLAN

Catch-Alls have FAMOUS FIRSTS too!

1947
- Molded Porous Core
- Only Full Flow Filter-Drier

1948
- Tamper Proof Seals

1949
- Replaceable Core Models
- Cores individually packed in hermetically sealed metal cans

Modifications will always be made, but only to improve the product... never to change it!

Ask your Sporlan Wholesaler for Bulletin 40-10 today

Catch-Alls are available for any system – fractional horsepower to over 100 tons

30 Firms Join

Baton Rouge RACCA Formed—Seeks Separate Refrigeration Code

BATON ROUGE, La. — Some 30 of the 40 companies engaged in air conditioning and refrigeration work in the Baton Rouge area have formed the Baton Rouge Refrigeration & Air Conditioning Contractors Association, Winston McCoard, secretary, announces.

The Baton Rouge RACCA is not affiliated with any national group, he said.

One of the chief aims of the new association is to get an air conditioning and refrigeration code approved by the city-parish council. This type of work is currently under the plumbing department, McCoard explained.

RACCA has approved a proposed code and passed it on to the city for adoption. Members hope this can be done within the next few months.

Officers of the Baton Rouge RACCA are Jack Felder of Commercial Refrigeration Co., president; Bob Woosley of Louisiana Air Conditioning Co., vice president; Van Brock of Van Brock Air Conditioning Service, treasurer; and Winston McCoard of ABC Heating & Cooling Co., secretary.

Board members are Hardy Claxton, Guy Herbert, Warren Boffinger, and Winston Rester.

Other projects planned by the association are a central credit and collection agency, a rigid code of ethics, and a training school for refrigeration men.

McCoard said that three of the largest refrigeration wholesale houses have joined RACCA as associate members.

Dues are $5 per month. Initiation fee is $10.

NEW

Tired of Excessive Head Pressure? And Costly Service Calls?

MR. DEALER
YOU CAN CHANGE ALL THIS NOW!!

By offering your customers up to 40% $avings in electrical bills and increasing the efficiency of his *Air Conditioner* as high as 60% just by installing the BRADLEY PRECOOLER: the last word for Air cooled Condensers.

THE BRADLEY PRECOOLER
has been engineered, developed and tested in the San Joaquin Valley of California, where it has

SLASHED OPERATING COSTS AND INCREASED UNIT EFFICIENCY.

- Automatic in Operation
- Simple to Install
- Low in Cost
- Increased Air Conditioner Life
- Minimize Service Calls and Repairs
- Both Commercial & Residential Models

Minimum Inventory — Generous Profits

Write or Wire

AMERI-KERN MANUFACTURING CORP.
P.O. Box 4202 — Bakersfield, California.
Phone FA 5-1231

for
QUALITY
"there's nothing like
G-B DUCT"— the proven "prefab" glass fiber duct! See full details on page 30.

Bell & Gossett Reports Highest Six-Month Period

MORTON GROVE, Ill.—Bell & Gossett Co. reported the highest net sales in the company's 44-year history for the six months ended May 31, 1960.

Sales for the period totalled $13,839,911, a 3½% increase over the $13,373,863 reported a year ago. Last year's sales were also a record for the six-month period.

Despite increases in labor and raw material costs, the company's net earnings of $762,738 were approximately the same as last year when they totalled $764,288, it was pointed out.

Earnings per share were equivalent to 48 cents on the 1,572,944 shares of common outstanding. Last year's earnings per share were also 48 cents.

In a letter mailed to shareholders, R. E. Moore, president, said that the outlook for the remainder of the fiscal year is encouraging and predicted that sales will continue at the same high level for the last six months, ending Nov. 30.

"Every facility we have is working overtime and our stocks in the field have never been lower," Moore said. "In some lines, the company has 30 days less inventory than normal."

He also noted that the order backlog is ahead of last year.

A sharp increase in sales of the firm's air conditioning equipment is one reason for the short stocks, it was pointed out. Moore predicted that compressors and air conditioning equipment will make up 15 to 20% of the company's volume this year.

He said that by June 15, the company had shipped twice as many compressors for air conditioners as it sold all last year.

Moore said a 32,000-sq. ft. addition now under construction will be placed in air conditioner production by fall. The firm currently has about 20,000 sq. ft. devoted to the air conditioner lines.

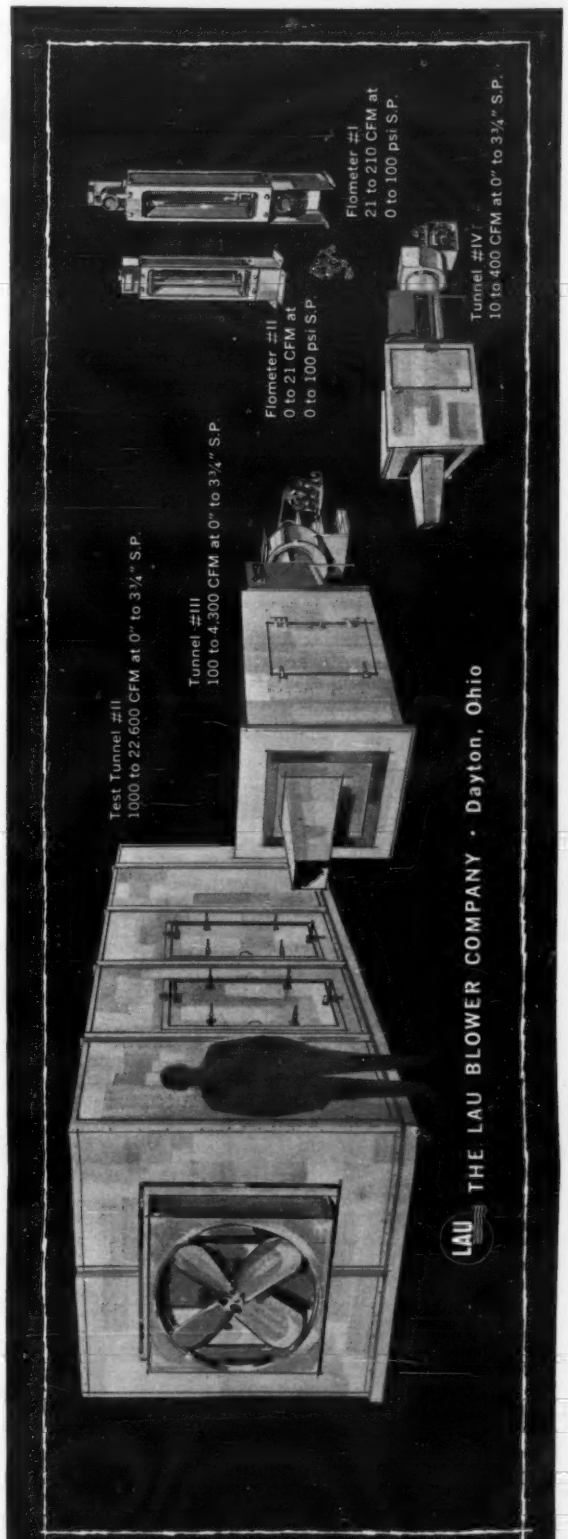
200 May Attend Silver Shield Dallas Meeting

DALLAS—Some 200 heating and cooling dealer-contractors from the Dallas metropolitan area are expected to attend a meeting scheduled for Tuesday evening, July 12 at the auditorium of the Dallas Light & Power Co. here to get the full story of the Silver Shield concept.

Silver Shield is the name given to a promotion and organizing program developed by the National Warm Air Heating & Air Conditioning Association.

Arrangements for the meeting were made in cooperation with Col. John A. Smith, Jr., chairman of the Silver Shield Action Committee. Also in attendance will be dealer-contractors from surrounding areas.

STEP FORWARD WITH LAU


Test Tunnel #II
1000 to 22,600 CFM at 0" to 3¼" S.P.
Tunnel #III
100 to 4,300 CFM at 0" to 3¼" S.P.
Flometer #II
0 to 21 CFM at
0 to 100 psi S.P.
Flometer #I
21 to 210 CFM at
0 to 100 psi S.P.
Tunnel #IV
10 to 400 CFM at 0" to 3¾" S.P.
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LAU

WHERE COMPLETE TESTING FACILITIES IMPROVE PRODUCT QUALITY

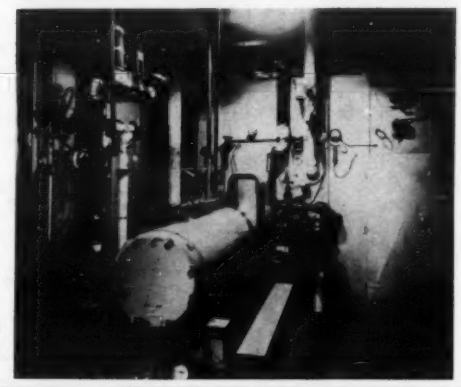
The Lau research laboratories are equipped to perform exacting tests on all blowers in the Lau line. Information derived from this testing is then fed back to the design engineering staff, enabling them to make changes that improve standard production blowers and their component parts. Because such thorough testing is conducted on all Lau products, you, as a customer, are assured of receiving the best possible blower for your application.

Shown are three test tunnels and two flometers that can measure blower performance from 0 to 22,600 CFM at 0" to 3¾" static pressure. Not shown is the giant Lau test tunnel #1 which is capable of air measurement from 1000 to 35,000 CFM at 0" to 6¾" static pressure.

LOCATED on a main traffic artery in a highly industrialized area, the two Linde buildings housing the air conditioned office space are joined in "L" fashion. Long arm of "L" in photo is actually two buildings. Air conditioned space is in building to right of white line. Main components of the system are located in rooftop installation circled.

20-Ton System Air Conditions Linde Facility 18 Hours a Day, 7 Days a Week for 190 Employes

Ulok Filters Cut Downtime, Maintenance



INSIDE THE ROOFTOP enclosure are two Trane multizone units, fresh air intake, and a 20-ton Worthington compressor.

NEWARK, N. J.—A 20-ton air conditioning system operates 18 hours a day, seven days a week to maintain comfort conditions for 190 employes working in the third floor drafting rooms and administration and engineering offices of the Development Laboratory of Linde Co., Div. of Union Carbide Corp. here.

The laboratory works to develop and commercialize processes and equipment for expanding the use of industrial gases in the making, shaping, and fabricating of metals.

Because the laboratory is located in a highly industrialized area with considerable amounts of dirt in the air at all times, all air must be conditioned and cleaned well before distribution to sensitive drafting and engineering areas.

The system cools in summer, heats in winter, and ventilates in between, according to A. G. Smalley, foreman of maintenance and construction for the laboratory. In addition it affords year-round humidity control.

Forced To Shutdown In Extreme Periods

Prior to installation of air conditioning, summer heat and humidity created difficult working conditions and, in extreme periods, forced occasional early shutdowns.

The 27,700-sq. ft. top-floor section also experienced some difficulty with dust entering open windows and skylights. For these reasons, the continuous operation of the air conditioning system is essential.

Major components of the system are located in a penthouse on the roof of one of the two adjacent buildings over which the L-shaped laboratory is spread. Cooling is provided by a 20-ton Worthington compressor and well water obtained at approximately 57° F. from a 500-ft. well located on the plant grounds.

Outside air enters the fresh air chamber on top of the penthouse through a damper controlled fresh air intake. During heating or cooling cycles, this fresh air chamber handles air at a pre-set rate of 8,000 c.f.m.

Fresh air is then filtered through a bank of "Ulok" cube shaped filters and passed over a series of three tempering coils — one steam, one water, and one refrigeration—mounted in series.

Recirculate 75% of Air During Heating Or Cooling Cycles

Next the conditioned air is passed on to a mixing chamber where it is mixed with recirculated air. During heating or cooling cycles, approximately 75% of air in the system is recirculated.

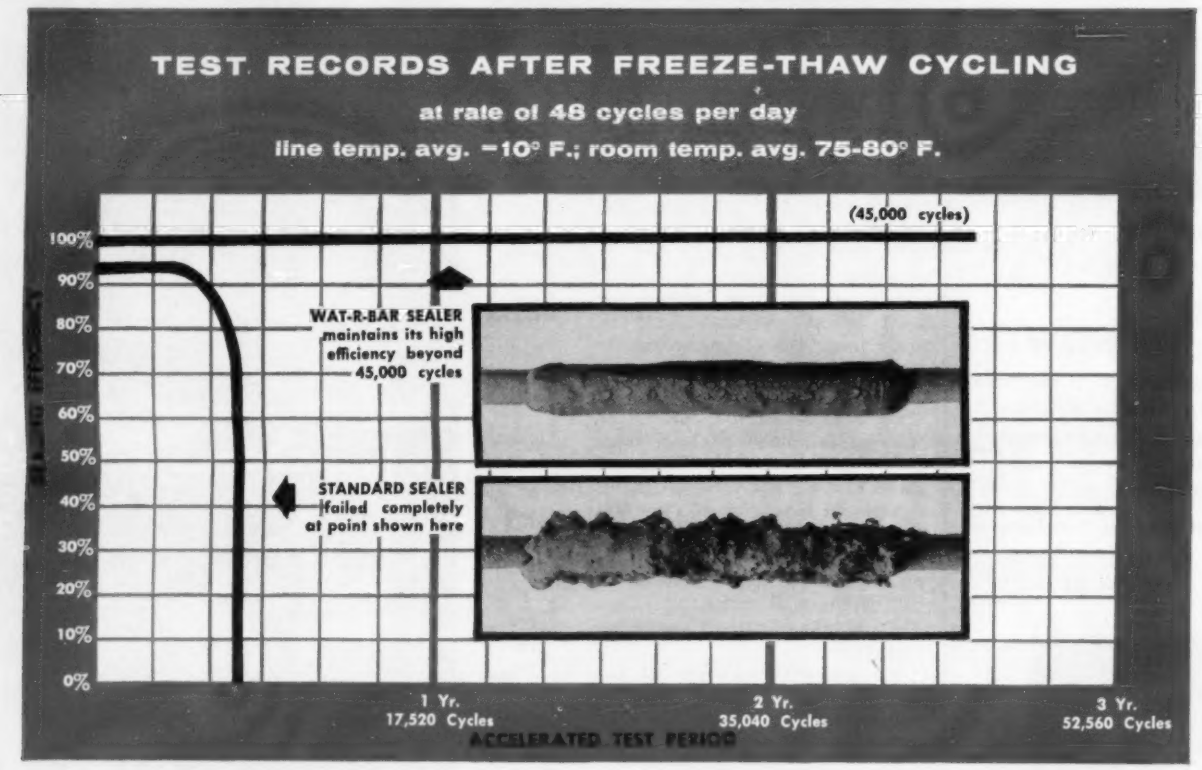
On opposite sides of the mixing chamber are two more banks of cube filters, each bank serving a separate distributing system. Mixed air passes through these secondary filters and through centrifugal type fan behind each bank.

These fans deliver a total of 31,000 c.f.m. and are powered by two 10-hp. Century motors. Beyond each fan is a Trane multi-zone unit containing the second series of tempering coils. Additional heating or cooling is accomplished by thermostatically controlled dampers which deflect the air through the tempering coils.

Finally, conditioned air from the multi-zone units is passed on to air conditioning ducts running between roof and a dropped ceiling of acoustical tile 9 ft. 6 in. above the floor.

These ducts range in size from 48 in. wide by 18 in. deep to 4 in. by 8 in. They feed seven zones within the two buildings.

Over-all program control is



45,000 freeze-thaw cycles and still going strong!

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When you specify *Wat-R-Bar* you know you have the best. Only with *Wat-R-Bar* do you have the time-proved evidence of lasting resistance to water vapor, high humidity, and temperature extremes.

Wat-R-Bar's superiority is another achievement of Presstite . . . leader in research and development of quality sealants for wide-range applications.

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We will be glad to furnish certified proof that *Wat-R-Bar* has completed more than 45,000 freeze-thaw cycles over a three-year period of accelerated tests. Write Dept. R-21.

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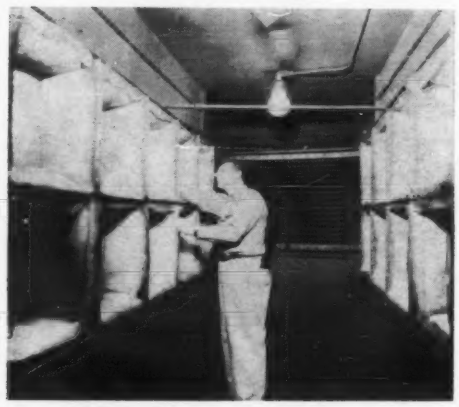


NEW ULOK Cube filters installed in the mixing chamber. Each bank of 12 filters serves one arm of the two-sided system. During initial installation period, they were checked daily for filtering effectiveness.

accomplished by means of standard electrical devices. In addition, an automatic cycling control can be pre-set to regulate operation of the system according to the day, hour, and minute, Smalley said.

Smalley pointed out that the cube-type filters are a late addition to the air conditioning system. They were installed about a year ago to help relieve severe maintenance problems.

Prior to that time, the three filter banks—one on fresh air and the other two for filtering the mixed air—were equipped with 72 flat, permanent type filters installed in pairs, one behind the other, in each cubicle of the filter bank. One was of oiled mesh type and the other self-generating precipitating type.

When the system was first installed, design engineers recommended that these filters be cleaned on a rigid schedule to minimize carry-over dirt into the system, Smalley said. Through trial and error, best results were obtained by weekly maintenance. This weekly maintenance involved about 500 man-hours per year.

Weekly Cleaning of Original Filters Was Major Project

To permit filter removal, either the air conditioning had to be shut down during the working day or overtime rates had to be paid for doing the job after hours. Since the plant elevator did not go to the roof, several men had to remove the filters and carry them down three flights to the yard where three large tanks were set up for washing, rinsing, and oiling.

To minimize downtime, two sets of filters were kept on hand, adding to initial cost and requiring storage space.

Last August, the laboratory took its problem to filter specialists of Union Carbide Development Co., another division of Union Carbide Corp. As a result the 72 permanent type filters were replaced with 36 Ulok cube-type filters.

These filters are claimed to maintain filtering efficiency and low static pressure differential even after several pounds of dirt have been collected. The air stream carries dirt into the cube and, as dirt builds up on the downstream face, air flow is shunted to the large filtering area of the four sides.

Smalley said initial installation of the new filters required about 10 man hours of labor. Continuously checked for filtering efficiency and resistance, the filters required no replacement or maintenance for six months. Filters operated efficiently and static pressure differential remained safely under the .5 in. maximum, he asserted.

At the same time, the company eliminated the cleaning tanks, saved storage space, and, in Smalley's opinion, improved the quality of air filtration. This opinion was based on lesser accumulation of dirt on ceiling diffusers and adjacent ceiling tile and no problems from entrained oil in the air stream.

Smalley estimated that 25 man-hours per year will be needed to maintain the filters.

Formica Corp. Adds Humidity-Controlled Room for Storage

CINCINNATI — Formica Corp. has added a humidity-conditioned room for the storage of engraving stock to its Cincinnati manufacturing plant.

The new facility insures the uniform quality of engraving stock against varying humidity.

Humidity levels in the room are maintained at 50-55%, room temperature at 75° F. In addition, continuous air filtration protects treated stock against uncleanliness. A 7½-ton air conditioning unit is used.

All-Electric Typographic Plant Will Be Air Conditioned with Heat Pumps

CHICAGO—L.S.T.—Typography broke ground recently for the construction of a new building which will be air conditioned the year-round by heat pumps.

The structure at 901 W. Monroe St. will be the first all-electric typographic plant in the city, the company claims.

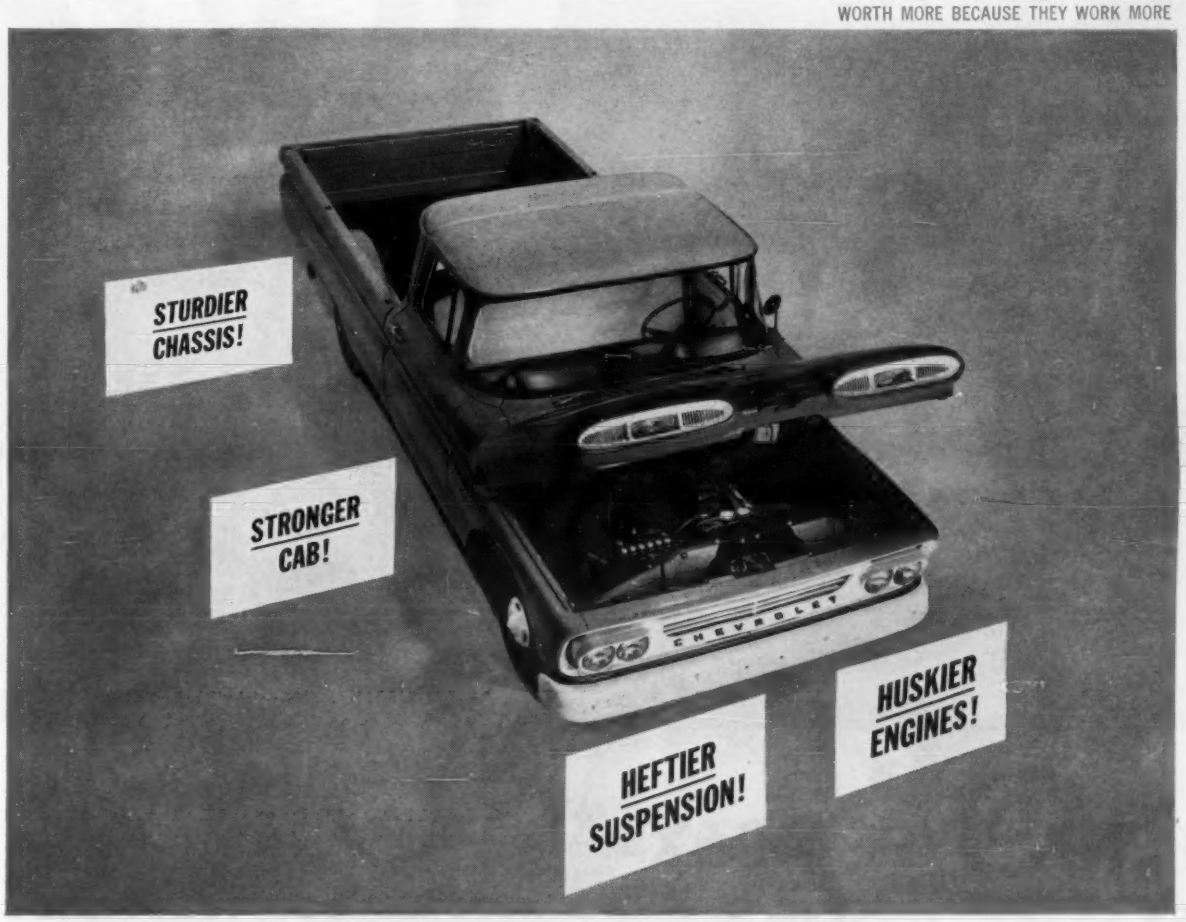
According to John E. Jensen, president of the 33-year-old Chicago firm, the one-story building is being erected at a cost of $350,000. Scheduled for completion in November, its 23,500 sq. ft. of floor area will be equipped with the most modern facilities for typographic composition.

"The plant's typesetting machines, melting pots, and other mechanical equipment will be entirely operated by electricity," it was pointed out. "Comfort similarly will be furnished 'by wire' via heat pumps. The all-weather machine will automatically heat or cool the building, depending on the season, and also provide filtered-air ventilation.

Edward Johnson is the general contractor for the new building and the architect is Eugene H. Meyer & Associates.

REPRINTS SELLING FOR PROFIT.
By Frank Klein—Only $1.00 ea. Clip this ad and mail with your name and address to: Air Conditioning, Heating & Refrigeration News, 450 W. Fort St., Detroit 26, Mich.

WORTH MORE BECAUSE THEY WORK MORE



CHEVY'S PUT TOGETHER TO STAY TOGETHER ...TO CLAMP DOWN ON COSTS! Here are the strongest truck components known ...assembled lastingly, with care and craftsmanship. It's Chevy's way of making sure you get maximum truck life; extra assurance of higher profits because of far fewer maintenance and repair charges.

NEW STRONGER CAB CONSTRUCTION. New steel braces reinforce cab underbody, help keep cab tight and solid. Husky new box-section pillars frame door openings, keep doors in lasting alignment. New roof panel is double walled for extra strength.

NEW STURDIER CHASSIS COMPONENTS. New stronger *frames* with rigid box-section rail design increase torsional stiffness up to 1100%! And *brakes* are bigger for longer brake life and safer stopping. Bigger capacity *axles* and *suspensions* boost load-carrying ability.

TRUCK-BUILT V8's AND 6's. Components such as brawny forged steel crankshafts, long-lasting precision bearings and oil bath air cleaners provide sure dependability that keeps your maintenance costs *down*.

NEW HEFTIER SUSPENSION smooths the ride; protects everything from wear and tear. Independently suspended front wheels, rigid control arms and strong torsion bar springs take tough runs with strength to spare.

■ Chevrolet's building 'em *tough* these days, even tougher than ever before. And that's saying something when you consider how Chevrolet trucks have stood up over the years. Here's a typical example:

101,000 miles on a truck-busting job—and still going strong! The strength and stamina of this Chevy pickup has paid off handsomely for the Mitchell Insecticide Company, Inc., of Fairfax, S.C. In rugged service, hauling maximum loads of nitrogen throughout the southeastern states, this Chevy has logged 101,000 miles with no mechanical trouble at all.

That kind of performance has been Chevy's stock-in-trade for years; and the '60's are designed to put out even more of it. See your dealer for all the details. . . . Chevrolet Division of General Motors, Detroit 2, Mich.

1960 CHEVROLET STURDI-BILT TRUCKS CHEVROLET

Export Opportunities

5 Countries Looking for American Refrigeration, Air Conditioning

WASHINGTON, D. C. — Export trade opportunities in England, Arabia, Italy, Scotland, and the Union of South Africa were listed recently by the Business & Defense Services Administration, U. S. Dept. of Commerce.

NEWS readers are invited to write to the editor giving their opinions on any subject of interest to the industry.

The agency said Refrigerator Equipment Co. (London) Ltd., 81 Hoe St., Walthamstow, London, E. 17, England, is interested in purchasing, and is seeking an agency, or possibly manufacture under license, for commercial refrigeration equipment, two-tier frozen food cabinets.

The firm, which is a sales agent, has a showroom in London of some 6,000 sq. ft. and workshops and servicing facilities throughout the United Kingdom, offering day and night service seven days a week. It sells to chains and self-service stores, hotels, etc.

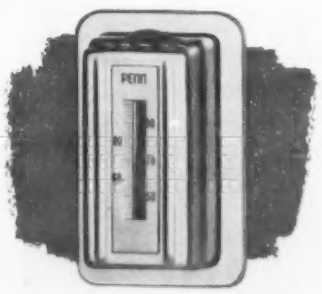
The United Arab Agencies, P. O. Box 410, Debai, Trucial States, an importing distributor, is interested in the direct purchase of cold storage equipment, automatic ice cream makers, and room air conditioners. It corresponds in English.

Interest in direct purchase of, and an agency for, air conditioning and refrigeration equipment, parts, and accessories has been indicated by "Termofrigo" di Utili Rizzieri, manufacturer, importer, exporter, and wholesaler, No. 3 Is. 322 Via Oratorio della Pace, Messina, Italy.

William Smith (Glasgow), Ltd., importing distributor and manufacturers' agent, 33 Virginia St., Glasgow, Scotland, wants to purchase, and obtain an agency for, refrigerators, washing machines, and electrical fittings.

Interbuy, manufacturers' agent, 122 Salisbury House, Smith St., Durban, Union of South Africa, wants to purchase electronic air purifiers.

PENN TYPE 426X
MAKES YOUR HEATING-COOLING
FAN COIL UNITS TRULY AUTOMATIC



Use the inexpensive Series 872X Heating-Cooling Thermostat with the Type 426X Changeover Control.

Don't make users play guessing games for comfort with your heating-cooling fan coil units. Penn Type 426X changeover control turns the job over *automatically* to the heating or cooling side of the combination thermostat. Sensing plate feels change in circulated water temperature —provides fast, positive shift in thermostat function. Unaffected by high or low temperatures encountered in unoccupied, non-conditioned areas. Setting is not shifted by electrical load. Unique construction provides single strap mounting in any position . . . assures *dry* operation in the most humid locations. Concealed screwdriver adjustment and adequate wiring space make the Type 426X a favorite with installers. For your next job, use Penn Type 426X.

PENN CONTROLS, INC. Goshen, Indiana

EXPORT DIVISION: 27 E. 38th ST., NEW YORK, N.Y.

AUTOMATIC CONTROLS FOR HEATING, REFRIGERATION, AIR CONDITIONING, APPLIANCES, PUMPS, AIR COMPRESSORS, ENGINES

Some Cooling Products On 'Maybe' List for Tariff Concessions

WASHINGTON, D. C. — The United States has placed self-contained air conditioning machinery and refrigerators and refrigerator parts on a No. 2 list of products on which it may ask tariff concessions from European Common Market countries.

Products on the No. 2 list are "alternates." If any products on the primary list on which this country will ask tariff concessions are removed during negotiations, products from the No. 2 list will replace them.

Negotiations under the General Agreement on Tariffs and Trade (GATT) are scheduled to begin in September at Geneva, Switzerland. Common market countries are France, Italy, Belgium, the Netherlands, Germany, and Luxemburg.

Their average tariff on self-contained air conditioning machinery (Schedule 84.12) is 12%. Average tariff on refrigerators and refrigerator parts (Schedule 84.15) is 13%.

Crane Closes Vancouver Office, Blames Labor Troubles, High Costs

VANCOUVER, B. C., Can.— "Unsettled labor conditions and continually rising costs" were cited by Crane, Ltd. as reasons for closing its Vancouver sales office and warehouse where it has been in business since 1908. The closing was effective July 1.

In a quarter page advertisement in newspapers, the company explained that it has been unable to reach agreement on wages with the Retail, Wholesale & Department Store Union, Local 535; the warehouse workers have been on strike since March 31, but sales staff and office workers continued working, according to the company.

"The Crane factories, Alliance Ware Ltd., and Canadian Potteries Ltd., New Westminster, will continue to operate and all products of the company will still be available from established wholesalers of plumbing, heating, and industrial supplies," the Crane announcement concluded.

Iron Fireman of Canada Appoints J. H. R. Hobbs As General Manager

CLEVELAND—Appointment of John H. R. Hobbs as general manager of Iron Fireman Mfg. Co. of Canada, Ltd. was announced here by Iron Fireman Mfg. Co., parent of the wholly-owned subsidiary.

The Canadian company, organized in Toronto in 1931, produces automatic oil-fired and gas-fired heating and cooling equipment and automatic coal stokers.

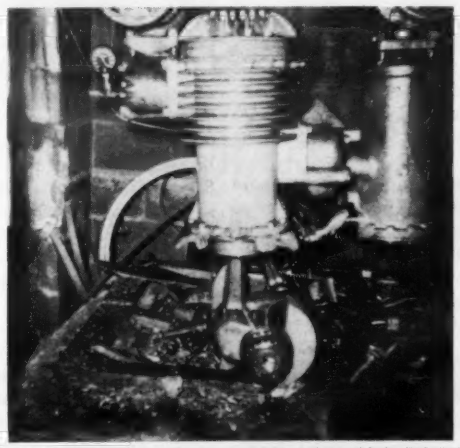
Hobbs formerly was vice president-general manager for Bryant Mfg. Co., also of Toronto.

EXPLOSION . . . . . 'CAUSE UNKNOWN'

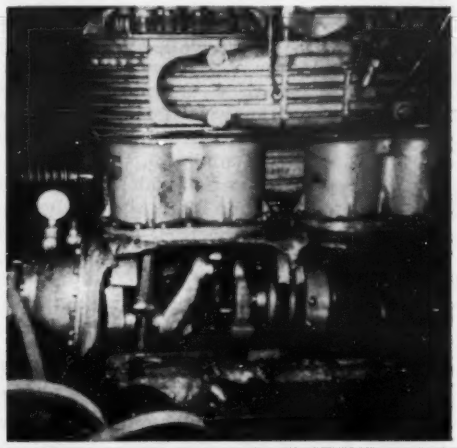
Crankcase of 60-hp. 4-Cylinder Compressor Bursts In Theater

UNEXPLAINED explosion of a 60-hp. compressor crankcase knocked this hole in the cement block partition while sending shrapnel in four directions.

SO POWERFUL was the explosion that it drove the heavy bed plate off the foundation.



A PUZZLING ASPECT of the explosion is that the innards of the crankcase were relatively undisturbed.



By Frank J. Versagi

DETROIT — What can cause the crankcase of a 60-hp., 4-cylinder compressor to explode with enough force to send shrapnel through a cement block wall, yet leave the crankshaft, connecting rods, and bearings in place?

Official reports on the explosion which took place at the Nortown theater here conclude, "Cause unknown."

The compressor, installed in 1938, had started up as usual about 4:00 in the afternoon and had run for two hours before the explosion. No one was injured; the audience mistook the noise for familiar sound heard when children played in an adjacent alley. Firemen who arrived within five minutes, ushered the moviegoers out without incident.

So powerful was the explosion that it drove the thick bed plate from beneath the compressor and sent shrapnel in four directions, according to Hugh Goslin, supervising inspector, Dept. of Buildings and Safety Engineering, City of Detroit.

"The system had all the necessary safety features; even the requirements of our new codes could not have prevented this explosion, as far as we can tell," said Goslin.

"We found one discharge reed missing, which would mean one piston was riding free; the snifter tube, a 5/8-in. tube from the crankcase to suction of the valve plate, was unobstructed," the city inspector told the NEWS.

"There was no evidence of fire at all," stated Detroit's assistant fire marshal Bernard De Coster. "Because the basement was filled with oil mist and refrigerant (R-12), we had to go in with air masks."

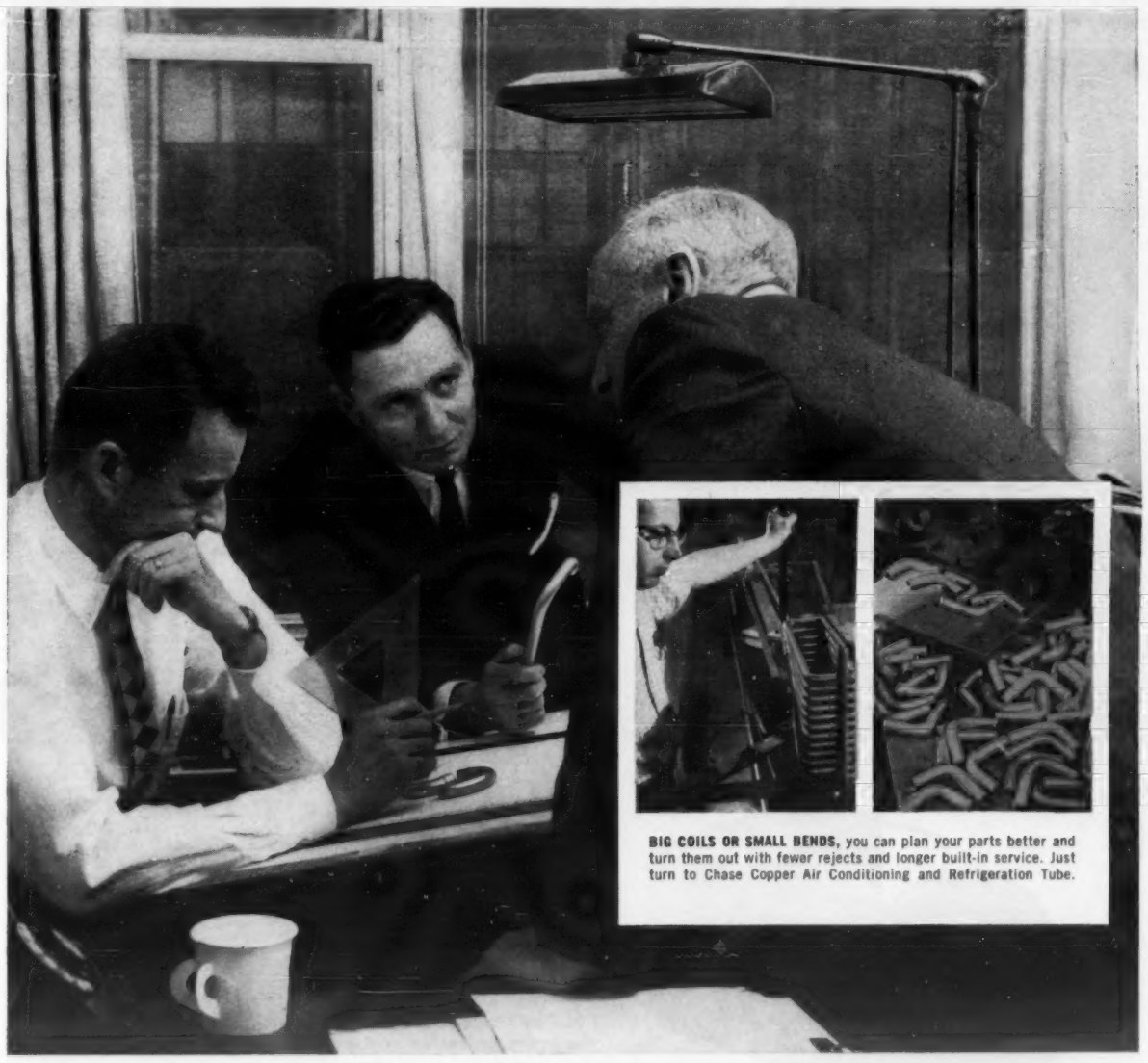
None of the several theories offered by experts and consultants seems to fit all the facts, according to Goslin's final report and the report of insurance investigators.

Those which hold that metal fatigue was the substantial rather than a contributing cause cannot account for the force which was powerful enough to send pieces of the crankcase flying in all directions. The same objection holds for those who felt the tolerance between the bed plate and the moving parts was too close and that some dragging took place.

The theory that, in some way, high-side pressure found its way to the crankcase and caused the explosion is apparently countered by the still functional snifter tube and by the fact that the highest head pressure which would have been obtained under the operating conditions was less than 200 p.s.i.

Those who hold that combustion of the oil caused the explosion are apparently refuted by the facts that the fire department which arrived within minutes states unequivocally that there was no evidence of fire. Further, there was no indication that the fluorocarbon refrigerant had broken down; there was no odor of halogen or phosgene.

So, the official reports conclude, "Cause unknown."



BIG COILS OR SMALL BENDS, you can plan your parts better and turn them out with fewer rejects and longer built-in service. Just turn to Chase Copper Air Conditioning and Refrigeration Tube.

You plan better with Chase® Copper Tube!

Fittings, Headers, Coils and other parts. Wherever you use copper tube in fabrication of parts, you'll find you can plan better if you turn to Chase® Copper Air Conditioning and Refrigeration Tube. You can get extra-long lengths of Chase Tube shipped on the new Disposable Reel—save space, time, manufacturing costs. And the tube itself is carefully tested to assure soundness. Chase expert metallurgy means you're getting tube that withstands severest manufacturing stresses without cracking or pinholing.

There's a Chase warehouse or sales office in the cities listed at right, ready to serve you.

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Benefits of Air Conditioned Schools

Teachers Cite Better Lighting, Freedom from Distractions, Flexible Seating, Easier Use of Visual Aids, Just Plain Comfort

(Continued from Page 1)

Smith school, then under construction, would be completely air conditioned.

"When it was finished in 1957, I moved in with a class of sixth grade gifted children which I had been teaching the previous year. At the conclusion of the year, my students moved on to secondary school. Thereupon I took over a fourth-grade gifted group.

"Thus I had the experience of changing from an uncontrolled to a pleasant climate, and back to an uncontrolled one again. In some respects the second move provided even sharper evidence than the first.

"Reactions of teachers and students, when we moved into Eunice Smith, were quickly apparent. In the case of the teachers, highly verbal. Something more than informal comment seemed necessary to give this discussion a firm foundation. I developed a questionnaire which was filled out by some 20 teachers in the Alton School District.

"Alton, of course, is only one city. Were the reactions of teachers and students similar in other locations? There were other elements of the physical environment to consider. What about lighting and color? In some areas windowless air conditioned schools had been built.

"Seeking answers, I interviewed some 150 teachers, administrators, supervisors, board members, and interested city personnel connected with air conditioned schools in San Angelo, Texas, and Hobbs and Roswell, New Mexico, as well as Alton.

"They included teachers from kindergarten through senior high in both public and parochial schools. I asked the teachers to fill out a questionnaire, then add information which was pertinent but not asked-for."

What Teachers Wanted Most

Results of this research revealed that teachers most wanted:

1. Comfortable seating in a room of adequate size and shape.
2. Control of lighting and visual environment, including elimination of outside distractions, use of attractive color schemes and adaptability to audio-visual techniques.
3. Control of noise and sound.
4. Control of thermal environment, plus CLEAN AIR.

Minimum recommendations today call for flexible seating in rooms which provide at least 30 sq. ft. per pupil. This doesn't need to mean traditional oblong rooms with stationary walls and conventional seating.

In windowless classrooms in Hobbs and Roswell, New Mexico, a new freedom of seating, without concern for window and light sources, is apparent.

Even more unusual is a circular school, Belaire Elementary, in San Angelo, Texas. Here the walls as well as the furniture are all movable.

Bookshelves and other large furniture pieces are on coasters. Partitions can be moved to open the classrooms to the auditorium located in the center of the building.

Such flexibility is not possible where there is concern for use of windows as a ventilation or light source.

Air Conditioned Schools Use Wide Variety of Window Arrangements

"Air conditioned schools I have seen," reported Mrs. McDonald, "use a wide variety of window arrangements. Some schools provide windows with venetian shades, supplemented by skylights which can also be covered. These windows are kept closed during the heating and cooling seasons.

"Others, such as Travis in San Angelo, have small windows up high which prevent the children from being distracted by outside events."

Newest trend: no windows at all. Del Norte and El Capitan in Roswell, Highland Junior High and St. Helen in Hobbs, exemplify this development.

A special problem exists in New Mexico. Because of lack of greenery and a superabundance of sand, glare on the north side of a school building is as awful as on the south.

That problem of glare has been solved by the windowless approach. Two colors of lighting tubes are utilized. One-third give a yellow glow to reduce shadows, and two-thirds are bluish-white.

When they are twinned, the equivalent of daylight is produced with no shadows or glare anywhere in the room.

Here are some comments from teachers which Mrs. McDonald gleaned:

"I have particularly enjoyed the perfect lighting. There are no shadows or glare and no eye strain. We have perfect visibility at all hours as well as complete black-out for use of projected material."

"Noise from air conditioning equipment is sometimes annoying, but it's a minor distraction when compared to the outside rackets in non-air conditioned rooms."

Windowless School Promotes Concentration

"The windowless school is conducive to better concentration. While taking standardized tests, the students in this building tend to be more attentive, listen more closely to directions, and are able to complete the tests in less time.

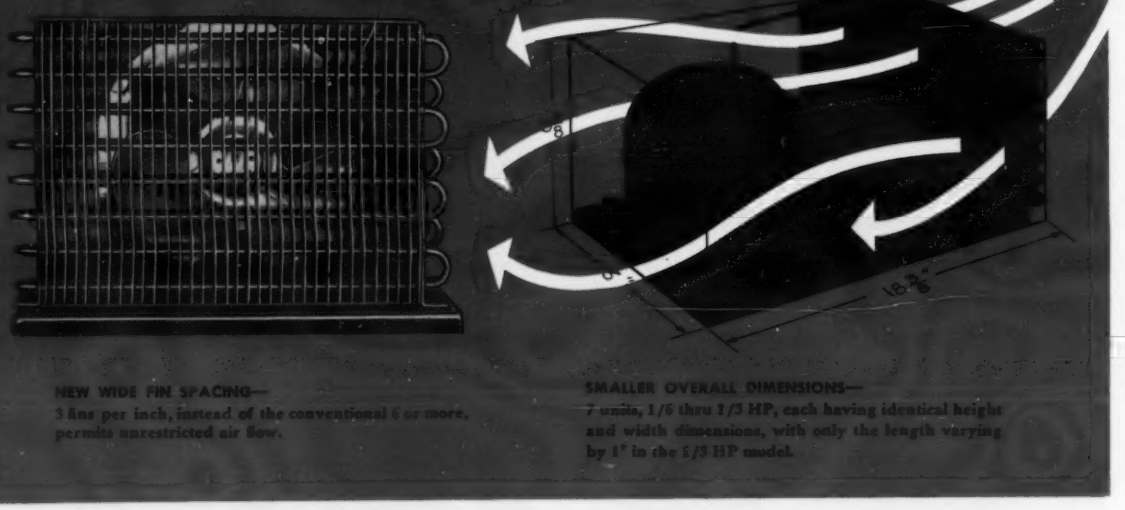
"Students who are taken to other buildings for special tests react negatively to the poorer conditions. They notice movements in the halls and outside the building and are more easily distracted during the testing situation."

At San Angelo, Texas, the high school designers have coped with lighting in an entirely different manner. An abundance of glass has been used—not just in windows—but walls.

Outside are attractively designed overhangs which furnish spots for natural "planters," as well as protected walkways for students.

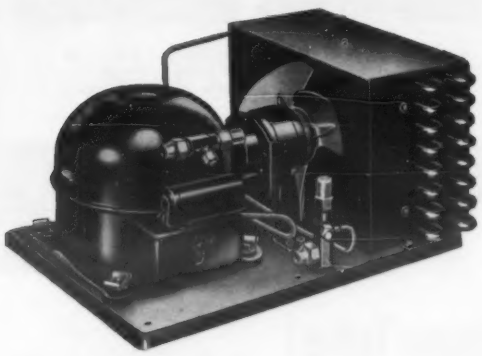
Glare also is reduced by soft

7 new space-saving condensing units with revolutionary FREE-FLO fin design



NEW WIDE FIN SPACING—
3 fins per inch, instead of the conventional 6 or more, permits unrestricted air flow.

SMALLER OVERALL DIMENSIONS—
7 units, 1/6 thru 1/3 HP, each having identical height and width dimensions, with only the length varying by 1" in the 1/3 HP model.



This all-new line of condensing units provides the manufacturer with the opportunity to reduce and standardize machine compartment size over a wide range of products. This compactness is possible for two reasons; new FREE-FLO condenser design which is smaller and incorporates improved non-clogging performance and heavier gauge construction, and the application of Tecumseh's proven Tiny-T compressor series. Additional features include rubber grommets to isolate the compressor from the base, eliminating vibration and muffling noise, and holdown clips to permit faster compressor installation.

Capacities in the new T-line condensing units range from 680 to 1450 BTU in the low temperature models, and from 2000 to 2950 BTU in the high temperature models. Along with the benefits of equal capacity in less space, T-line customers will gain from decreased freight costs because of the lower unit weight, plus all the other advantages which Tecumseh mass production efficiency affords. Contact your nearest Tecumseh sales office or call the factory direct for further information.

Model T63L—1/6 HP
Model AT5CL—1/5 HP
Model T53H—1/5 HP
Model AT43L—1/4 HP
Model T55L—1/5 HP
Model AT4CH—1/4 HP
Model AT35L—1/3 HP

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drapes which add color and beauty. These drapes are hung on inside partitions and on exterior walls.

As for visual aids, Mrs. McDonald reports that the usual 10-to-15 minutes are not needed to adjust blinds or rearrange children and set up the screen.

With a "flick of the wrist" the screen comes down, lights go out, and any type of visual aid—slides, movie overhead or opague projector—is ready for use.

Work Space on Walls More Prevalent In Windowless School

Another great advantage of air conditioned schools, according to teachers, is the vast amount of workable space around all four walls. Chalkboards, pegboards, and bulletin boards can be designed to meet the needs of teachers.

Disturbances from the outside always have been hectic to classroom teachers. The control of sound, as well as sight, has vital significance to them.

Whenever indoor climate can be ordered mechanically, and windows are eliminated or kept closed, class rooms are virtually soundproof and the attentiveness of children is vastly improved.

When hallway doors are closed, interior noises are shut out. Genuinely useful teaching and learning time thus is increased by removing interference from the sounds of traffic, mowers, and physical education classes.

Need for Cooling Greater Today Than A Decade Ago

Continues Mrs. McDonald:

"I believe the need for air conditioning is much greater in schools today than it was a decade ago.

"Throughout the country more children and adults are wearing sports clothes at home and for many other activities. Consequently, when dressed for school, students find unfavorable temperatures much more noticeable.

"Another factor is the widespread use of air conditioning in business places, churches and theaters, as well as in the home and family car. Do we expect the most efficient teaching and learning in situations which are far less comfortable?

"My conclusions were confired by the responses of other teachers in Alton, San Angelo, Hobbs, and Roswell. The questionnaire was filled out by 125 teachers. One of the questions asked was:

Teacher Attitude, Work Pattern Improved

"To what extent would you say teacher reactions, attitudes, and work patterns are improved or influenced by air conditioning?

"If we are less tired and more agreeable it is obvious that we can do better work. More than 95% of the teachers testify to this reaction.

"Time always is an important factor in the classroom. Since we don't have to rearrange the children or adjust the windows, 81% of the teachers interviewed believe that they would have more time for the class."

When the temperature is high and children are uncomfortable, especially in elementary grades where the student's attention span is shorter—it is difficult to introduce new material.

But with air conditioning, 92% of the teachers feel they can start a new unit of work at any time.

"Where the classroom climate is not controlled, we also teach the difficult subjects, or those in which the most drill is needed, in the morning when it is cooler.

"But this is possible only in elementary schools. In junior or senior high there is a noticeable difference in performance between first and sixth-hour classes in the same subject," concludes Mrs. McDonald.

Many teachers are reluctant to evaluate the effect of a good classroom environment on improving grades achieved by students. Reasons: difficulty of comparing those in non-air conditioned buildings, and the fact that there is no accurate ruler to measure educational progress.

Yet, most are convinced that students do better work in an air conditioned room. It is interesting to note the greater belief in air conditioning's effect on learning new subjects as compared to use of skills already learned.

Eighty-four per cent say it is of "much" or "moderate" help in the one situation while 59% claim it affects the latter. Many teachers felt the question about willingness to do research didn't apply in their classes because no research was called for, which accounts for the 37% "no answer" vote.

The highest score for, which was recorded for greater ability

(Continued on next page)

Texas National Bank Air Conditioning

CONCISE CONTROL of 1,800 tons of air conditioning in the Texas National Bank Bldg. in Houston is maintained by two 5-hp., two-stage Brunner air compressors. The compressors control operation of Powers Regulator summer-winter pneumatic thermostats that serve the 21-story building. Responsible for the Texas National installation are Kenneth Franzheim, architect; Bernard Johnson & Associates, consulting engineer; Manhattan Construction Co., contractor; Power Regulator Co., subcontractor and supplier of Brunner units.

In convention halls, coffee shops and commuter trains...

Heated discussion is still a convention trademark, but physical swelter has given way to air-conditioned comfort in giant convention halls. The amount of air-conditioned space needed for meetings and exhibits often has a bearing on the location chosen for major conventions.

Quick snacks and coffee breaks are bread and butter to the modern air-conditioned "coffee shop"—a relatively new and thriving institution in busy urban centers.

Brow-mopping days are over for many train travellers, thanks to air-conditioning. Air-conditioned cars pay off in increased traffic—and immeasurable good will.

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For great and small cooling jobs by the thousands—for original or replacement charge—you'll find "Genetron" Super-Dry Refrigerants approved . . . accepted . . . preferred! Men who manufacture America's finest refrigeration and air-conditioning equipment as well as those who design it, install it and service it, all endorse "Genetron" Super-Dry Refrigerants. Wholesalers recommend them for their consistent high purity, maximum dryness, and over-all top quality.

"Genetron" Super-Dry Refrigerants are stocked from coast to coast by all leading wholesalers. Use the best! Insist on "Genetron" Super-Dry Refrigerants!

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MONOCHLORODIFLUOROMETHANE

genetron 113 PURPLE LABEL $C_2Cl_3F_3$
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genetron 114 BLUE LABEL $C_2Cl_2F_4$
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Allied Chemical

3 HP
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Model PA 30-A

- ★ In 2, 3, 4, and 5 HP
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- ★ Low silhouette for flat-roof work

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Benefits of School Air Conditioning--

(Continued from preceding page)
to concentrate, with 93% in the "much" or "moderate" effect columns. More effective use of study time drew 81%.

Here is what teachers believe comfortable conditions do for student reactions and behavior patterns:

- The three highest "much" or "moderate" effect votes were scored for less tension, 94%; less fatigue, 97%; and less drowsiness, 96%. Where arms and papers don't stick to desks, papers are almost certain to be neater.
- Students returning from an air conditioned gym are able to start their academic work immediately, without the usual lull of resting and cooling.
- Not only is schoolwork itself improved, but in cities where summer school is taught in air conditioned buildings, the number who volunteer for advanced work increased substantially.

Summer School Enrollment More Than Doubled In Air Conditioned School

- In San Angelo, George S. Faulkner, assistant principal in charge of summer school, reports that enrollment has more than doubled since moving into an air conditioned building.
- In Alton, Ill., summer school enrollment in 1956 was 189, and in 1957 it was 226. In 1958 with an air conditioned building it jumped to 306, and in 1959 to 367.

There are the major benefits to students and teachers. There are some fringe benefits, too.

Architect, Teacher, Superintendent Favor Cooling

SCHOOL AIR CONDITIONING can "reduce the cost of a new school building significantly by means of compact design," said Architect Walter Rolfe . . . "has proved conducive to better concentration and better learning where it has been used," declared School Teacher Mrs. Eva McDonald, who has taught in and surveyed conditions in air conditioned schools . . . "permits dramatic changes in school design to pare construction costs while improving learning facilities" averred Syracuse School Superintendent Paul Miller.

- Cleaning the air and regulating the climate keeps displays in better condition, permits more valuable displays, ends insect invasions, and generally eases the teachers' problems from blowing papers, drafts, and unequal temperatures.
- Moreover, 70% of teachers interviewed say that they enjoy doing overtime work at the school itself when conditions are pleasant.

Dramatic changes in school design which will reduce construction costs while improving learning facilities were forecast by Dr. Paul Miller, superintendent of schools in Syracuse, N. Y.

He averred that nearly half of the 300 school administrators he has polled expect designs to change significantly during the next few years.

The school of the future will be in operation 12 months a year, he predicted. It will provide learning for all ages, will have complete air conditioning, pushbutton TV, radio, film, and records, including a TV hookup enabling the parent to look in on the classroom.

Research Project Shows Lower Costs for Air Conditioned School

Walter Rolfe, Houston architect, described a research project in which his firm was able to reduce the cost of a new school building significantly by means of compact design made feasible by using air conditioning and controlled lighting.

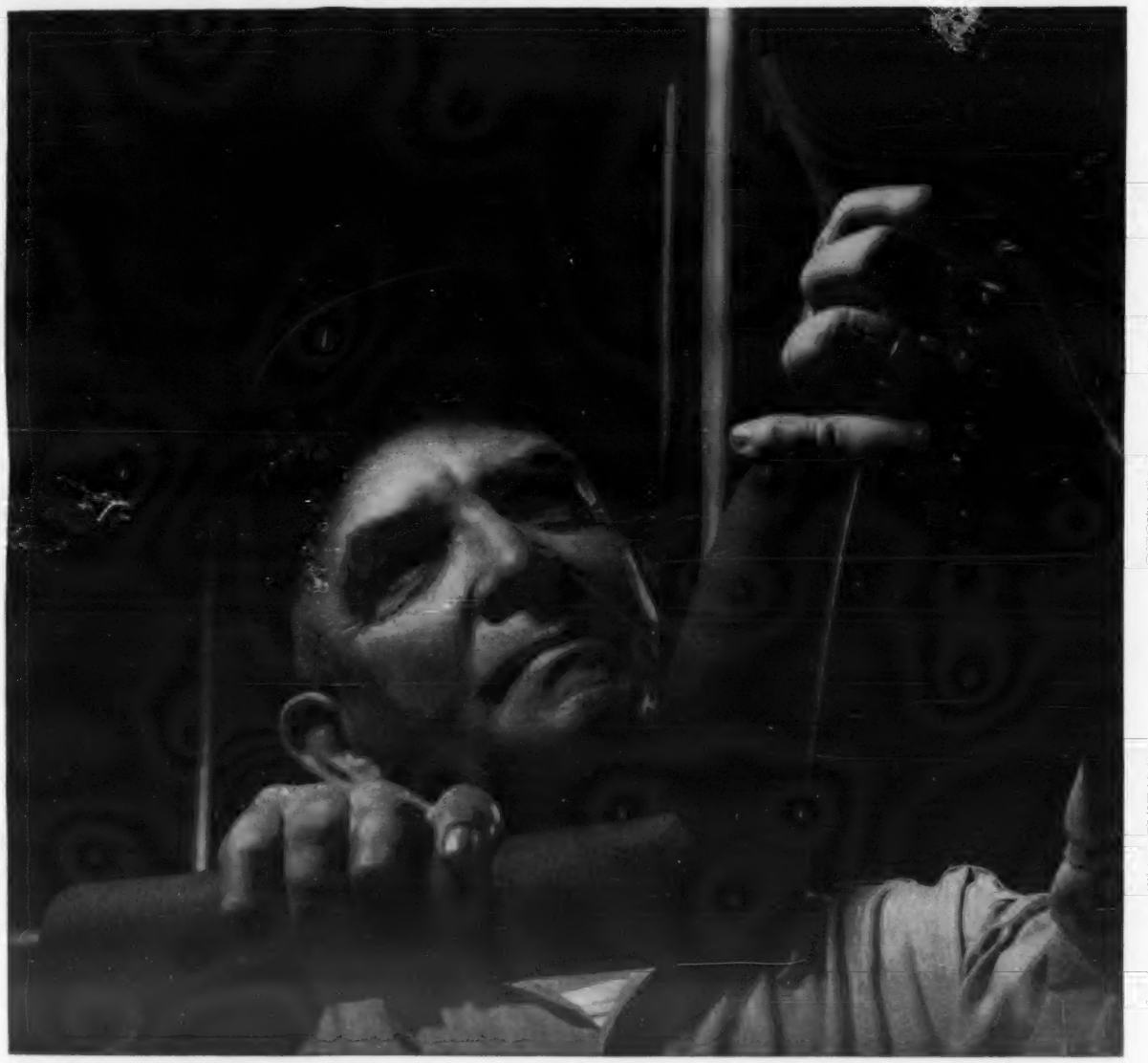
Among the new features desired by educators, and provided in his cost-cutting design, are classrooms of flexible size and shape.

A reduced price-tag for these windowless compact school buildings includes the cost of air conditioning equipment! Mr. Rolfe reports.

Schools in various parts of the country, in which compact designs based on controlled environment have cut costs by as much or more than the charge for air conditioning are plentifully in evidence.

Returning to Mrs. Eva McDonald, the public school teacher in Alton, Ill.: That survey she made among 125 teachers in air conditioned schools revealed:

- Eighty-one per cent of the respondents declared it has a grand effect on their student's ability to learn new subjects. Ninety-three per cent think students can concentrate better, 94% agree they show less tension, and 96% testify that they are less fatigued.



Less time spent elbow-bending on the job

B.F.GOODRICH INSULATION TUBING CUTS IN HALF LABOR COSTS FOR INSULATING PIPE

IT'S as easy as slicing bread to cut elbows out of BFG insulation tubing—a sharp knife and a miter box are all you need. Parts cement together in seconds. Straight runs go on faster, too. If pipes are already connected, it can be slit, snapped on and cemented in half the time it usually takes for other methods of insulation. Slitting is unnecessary for new lines—it quickly slips on straight or bent pipe as easily as a ring on your finger.

B.F.Goodrich tubing is made of a tough, flexible rubber with millions of uniform, non-connecting cells that seal out air and moisture. It can be used for insulating pipes carrying hot or cold liquids at temperatures ranging from −20°F to 200°F. It's clean, easy to work with—doesn't rub off, chip or crumble. It comes in 6-foot lengths in many wall thicknesses that are easy to handle, easy to store. This BFG insulation is also self-extinguishing, so it can be installed on copper tubing before sweat fittings are made—tubing is merely pushed back and held by clamps while joint is soldered.

Try this labor-saving insulation on your next job. For full information on B.F.Goodrich insulation tubing, call your B.F.Goodrich distributor, or contact *The B.F.Goodrich Company, 180 Derby Place, Shelton, Connecticut.*

INSULATION TUBING BY B.F.Goodrich

APPLICATION ENGINEER

Need young graduate engineer who is interested in training to perform Application Engineering for progressive Air Conditioning and Heating Company. Experience in this area of work or in sales engineering desirable but not necessary. Work can lead to Sales Engineering position in field or to permanent Application Engineering position at factory.

BOX A6580, Air Conditioning, Heating & Refrigeration News.

NEWS readers are invited to write to the editor giving their opinions on any subject of interest to the industry.

New ARI Certification Directory To Contain 2,350 Units Manufactured by 51 Firms

WASHINGTON, D. C. — A new edition of the Directory of Certified Unitary Air-Conditioners will be published by the Air-Conditioning & Refrigeration Institute early in July, it was announced by Frederick J. Reed, ARI chief engineer.

The edition will carry certified ratings on 2,350 units of 51 manufacturers participating in the Unitary Air-Conditioner Certification Program sponsored by the Unitary Air-Conditioner Section of ARI.

"Now a year-and-a-half old, the certification program has proved to be an outstanding success in providing solid certified ratings of unitary equipment, eliminating conflicting criteria and varying terminology which had confused the public up to the time of the program's adoption," the announcement asserted.

Tests are being made continuously in the special facilities constructed at Electrical Testing Laboratories, New York City, of the units selected for testing under the "random testing" phase of the program.

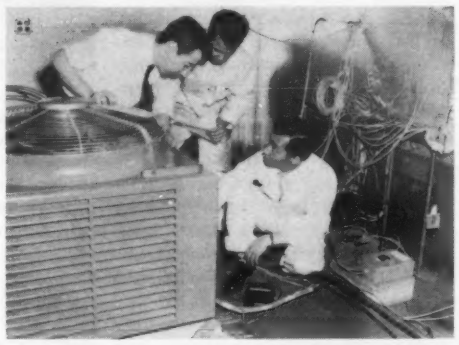
In addition to the testing by ETL, participating manufacturers agree to the testing of their equipment by competing manufacturers in their own laboratories, reporting the results to ARI, which will take suitable action where indicated.

As of a recent date, some 30 units "have been through the series of severe, punishing procedures which, in some cases, take as long as a week for a single unit, and only in three or four cases have deficiencies in either rated capacity or equipment performance been found," it was stated. "Corrections have been or are being made by the manufacturers of these units to guard against withdrawal of the right to use the seal of certification."

Meanwhile, the program has been publicized throughout the industry and "has met with virtually unanimous approval," according to ARI.

Participating manufacturers have disseminated to the public copies of "A New Assurance," the booklet describing the program, and successive issues of the Directory through their channels of distribution, and the ARI staff has distributed thousands of single copies in response to "write ins" from the public.

These requests have resulted from publicity issued by ARI announcing the availability of information on the program. This publicity has included a newspaper clipsheet, designed for use by daily newspapers in preparing special air conditioning sections, and from magazine articles in a number of consumer magazines. More than 110,000 copies of "A New Assurance" have been distributed.



CONDENSING UNIT of a split-system unitary air conditioner is being connected, via copper tubing and electrical connections, to undergo testing at Electrical Testing Laboratories under the ARI's Unitary Air Conditioner Certification Program. Two special "rooms within rooms" were built as a part of the equipment installed at ETL expressly for these tests. The condenser shown here is being set up in the "outside" room; its matched compressor and evaporator will be in the adjoining "inside room" for testing. Both metal-lined rooms may be used calorimetrically or psychrometrically, and are regulated by banks of controls located outside the rooms themselves, to make certain that the units under test operate in true test conditions. In the picture are Earl J. Gmoser, supervisor appliance testing at ETL (left), Refrigeration Technician Tony Di Spaltro, and Engineer George Yamamoto, kneeling beside unit.

The air conditioning material included in the clipsheet has been used by some 85 or more newspapers already this year. A number of further magazine articles are scheduled for publication during the coming months promoting air conditioning generally and the Unitary Certification Program specifically.

One result of the program has been an Air Force directive to the effect that all unitary equipment purchased by USAF purchasing officers must bear the ARI Seal of Certification. Similar action in other purchasing agencies of the government may be expected to be forthcoming, ARI said.

Air Conditioning Catches Up With County Court House

NEWARK, N. J. — The *Newark News* reported recently that "The air conditioning age finally caught up with the Essex County Courthouse . . . or at least a part of it."

The newspaper said two 2½-ton window units were installed in two courtrooms at the direction of the board of freeholders to help provide some relief during the summer while the courts are in session. Only two courtrooms needed to be air conditioned because the courts operate on a limited basis during the summer recess.

Meanwhile the freeholders are considering whether both the courthouse and Hall of Records should be centrally cooled.

Looking for a Business to Buy . . . ?
Check the Business Opportunities Section in the classified advertising columns.

tames summer heat and **humidity!**

MUELLER CLIMATROL
925 HUMIDITY-CONTROL
AIR CONDITIONER

This remarkable unit gives you *twice* as much to sell! That's because it does what no other central air conditioner can: It dehumidifies *whether or not* cooling is needed. The operation is controlled automatically by a thermostat-humidistat — so the homeowner sets humidity as well as temperature level! You sell three-stage operation: 1) 2 h.p. cooling and dehumidifying . . . 2) 4 h.p. cooling and dehumidifying . . . 3) 2 h.p. dehumidifying only.

The 925 packaged unit is easily installed, too. It's shipped completely pre-assembled, pre-wired, pre-charged, and tested. Just position it quickly and easily — inside the utility room, attic, or basement; through the wall; even outside on slab or roof. Yes, it's ARI Certified. Put this one-two punch of cooling and dehumidification to work for *your* business. See your Mueller Climatrol representative *soon*. Or write direct for additional information.

The Complete Line for Indoor Climate Control

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M2-49

'Exaggerated Claims' for Electric Heat Hit In Symposium Staged at NAPC Convention

COMPETITION posed by electric heat was aired in a panel discussion at the recent 78th annual convention of the National Association of Plumbing Contractors by (l. to r.) Arthur McManus, Paul Inman, R. F. Lunt, Andrew Psiakis (hidden by Lunt), Douglas Grewer, Alvin Buschel, and J. H. Soehnlen, moderator

CLEVELAND—"Electric resistance heat is serious competition," declared Douglas Grewer of the Better Heating-Cooling Council as one of the speakers at a panel on electric heat staged by the National Association of Plumbing Contractors at its 78th annual convention here recently.

"The proponents of electric heat are big business and are spending large sums of money to tell their story. They have been making some progress, too," Grewer said.

Other panelists were contractors Arthur McManus and Paul Inman, R. F. Lunt of Iron Fireman, Andrew Psiakis, consulting engineer, and Alvin Buschel of Slant/Fin Radiator. Moderator was J. H. Soehnlen.

Yet, Grewer emphasized, "on the basis of our initial explorations of the electric heat situation, it is felt that many of the much advertised, much publicized claims for electric heat have been grossly exaggerated. Further, many of the installations sold to date have been sold on the basis of these exaggerated claims. . . .

"This does not mean, however, that a threat no longer exists," Grewer continued. "We can expect to see even more money being spent on advertising and promotion by the proponents of electric heat. Only through continued and strengthened promotion by BHC for hydronics, coupled with efforts of allied groups, AGA, OHI, etc., can our industry expect to win out in this competitive situation."

School Heating Survey

Discussing activities of the industry-wide campaign to promote hydronics as opposed particularly to electric heat developed in cooperation with the Joint Industry Program Committee of the Plumbing and Pipe Fitting Industry, which has been in operation for nearly four months, Grewer presented a summary of tentative conclusions already arrived at with respect to "the electric heat situation in the vital area of school heating:

"1. In all cases studied to date, we have found that when all costs are included, such as supplemental insulation, double glazed windows, etc., the initial cost of an electrical heating system is considerably higher than a piped heating system. This is contrary to general belief in the industry today.

"2. An electrically heated school building will cost anywhere from 30% to 60% or more to operate than an equivalent, hydronically heated school.

"3. While a chimney is not required for an electrically heated building, the space required for the necessary auxiliary equipment (incinerator, hot water heater, water treatment equipment, transformers, and electrical distribution equipment) is often greater than for a hydronically heated building. Also, an incinerator usually requires a chimney in any case.

"4. The control system necessary to achieve the degree of modulation in an electrical system equivalent to a zoned hydronic system is prohibitively expensive. It is usually not included in the electric bid.

"5. Most bids which include a comparison of two different heating systems submitted on behalf of an electrical system overestimate the initial, operating, and maintenance costs of a hydronic system.

"6. Of an estimated total of 9,301 schools built in the United States during the nine-year period from 1950, only an estimated 130 are heated electrically.

"7. Where state or local codes for specified ventilation requirements are rigidly enforced, it is difficult to economically temper the necessary outside air needed for ventilation due to the high heating cost per B.t.u. of electricity.

"8. Several schools and commercial buildings threatened by electric heat have been converted to hydronic heat when the officials were fully informed about all the facts concerning both systems.

"9. Advantageous low cost construction techniques are usually not possible when electric heat is to be used. For example, if economy is important, the high heat losses involved and the insulation required for multi-story curtain wall construction automatically rub out the use of electric heat," the summary concludes.

Recent publicity efforts of BHC in promoting hydronics as opposed to electric heat were also described by Grewer, citing several published studies, including one from AIR ENGINEERING magazine, showing much lower costs for gas-fired hydronic systems for school heating in comparison with electric heat.

Similar cost data was presented by panelist Andrew Psiakis, Cleveland consulting engineer, who disclosed that a school in a Cleveland suburb had been designed in two ways, one design using a standard hydronic heating system, the sec-

ond design being for electric heat.

"The hydronic system," he explained, "used standard components, but the electric heat design called for light-weight residential type heating components."

First cost of the gas-fired hydronic system was estimated at $267,284 while the electrically heated building would have cost $261,636, or a difference of about 2%, Psiakis said.

Electric Heating's Higher Operating Costs Pointed Out

There was a big difference in operating costs, however, he pointed out. Fuel cost of the gas-heated building was estimated at $1,490 a year, while the fuel cost for the electrically-heated building, even though it was double-glazed and had "6-4-2" in. of insulation, was figured at $5,660 a year, according to Psiakis.

Attention was also called by Psiakis to the fact that "we use the proven degree-day method to calculate operating costs, which makes few assumptions, while electric utilities make many assumptions in estimating electric heat operating costs."

Another panelist, Alvin Buschel of Slant/Fin, struck out against the "apathy" of plumbers regarding heating, citing "the poor attendance at this panel session" as an indication.

"Plumbing has contributed to the downfall of heating in this industry," he declared. "Much more effort is devoted to selling plumbing, which you'll get anyway."

Praising the activities of BHC, Buschel emphasized that "we have to crack open the tract builder market. We have to sell hydronic heating, not on the basis of price but on the strength that it will sell houses faster for the builder," he said.

Buschel also made the point that "we're going to have to learn to live with rival heating systems. Co-existence is the prime thing."

A comparison of the development of electric heat in the Spokane, Wash. area with the promotion of radiant floor panel systems there several years ago was presented by panelist Paul Inman, who decried the "cut-price competition" that "killed floor panel systems in one year" and has hit baseboard hydronic systems more recently.

Electric heat contractors are now "really selling and at a higher price" than hydronic systems, Inman declared, adding, "somehow we have to keep the chiselers out of our business."

AGA Reports May Conversion Burner Sales Up 20.3% over Last Year

NEW YORK CITY—A step-up in home improvement activity is reflected in May shipments of gas conversion burners and direct heating equipment, the Gas Appliance Manufacturers Association reported.

Factory sales of conversion burners numbered 8,300 for the month, a 20.3% increase over the 6,900 units sent to market in May of last year.

May shipments of room heaters and other types of gas direct heating equipment, which totaled 84,600 units, were up 33.4% from the 63,400 heaters sent to market in the same month of 1959. The five-month unit sales total of direct heating equipment for this year was 311,200, a decline of 3% from last year's 320,700 units.

Edward R. Martin, GAMA's director of marketing and statistics, said his monthly telegraphic survey of manufacturers showed that sales of gas-fired central heating equipment, including conversion burners, totaled 84,304 units for the month. This was a 6.6% drop from the 90,307 units reported for May of last year.

Gas furnaces accounted for 67,000 unit sales in May, a 9.9% decline from the 74,400 furnaces dispatched in the same month of 1959. In the first five months of this year furnace sales totaled 315,400 units, an 8.1% dip from 343,200 reported in the same period of last year.

Gas boilers sold in May of this year and May of 1959 were at identical levels, 9,000. This year's five-month total for this equipment, however, was 10.1% ahead of last year's record-breaking pace. The amounts were 43,402 and 39,426 for the current year and last year, respectively.

In the first five months of this year, conversion burner sales amounted to 38,900, a 21.6% improvement over the total reported for last year's first five months, 32,000.

Sales of gas heating units other than central heating equipment were as follows:

Vented recessed wall heaters—May shipments amounted to 24,500 for this year, a 24.4% drop from last year's 32,400. This year's five-month total, 134,400, was 15.8% less than last year's 159,600.

Gas floor furnaces—The May amount was 4,700, a 28.8% drop from the year ago figure, 6,600. The five-month totals for this equipment were 26,200 and 30,200 for the current and previous years, respectively, revealing a 13.2% decline.

Gas unit heaters and duct furnaces—shipments of this equipment, which is used primarily for commercial and industrial applications, increased 7.3% for the month and 16.1% for the five-month period.

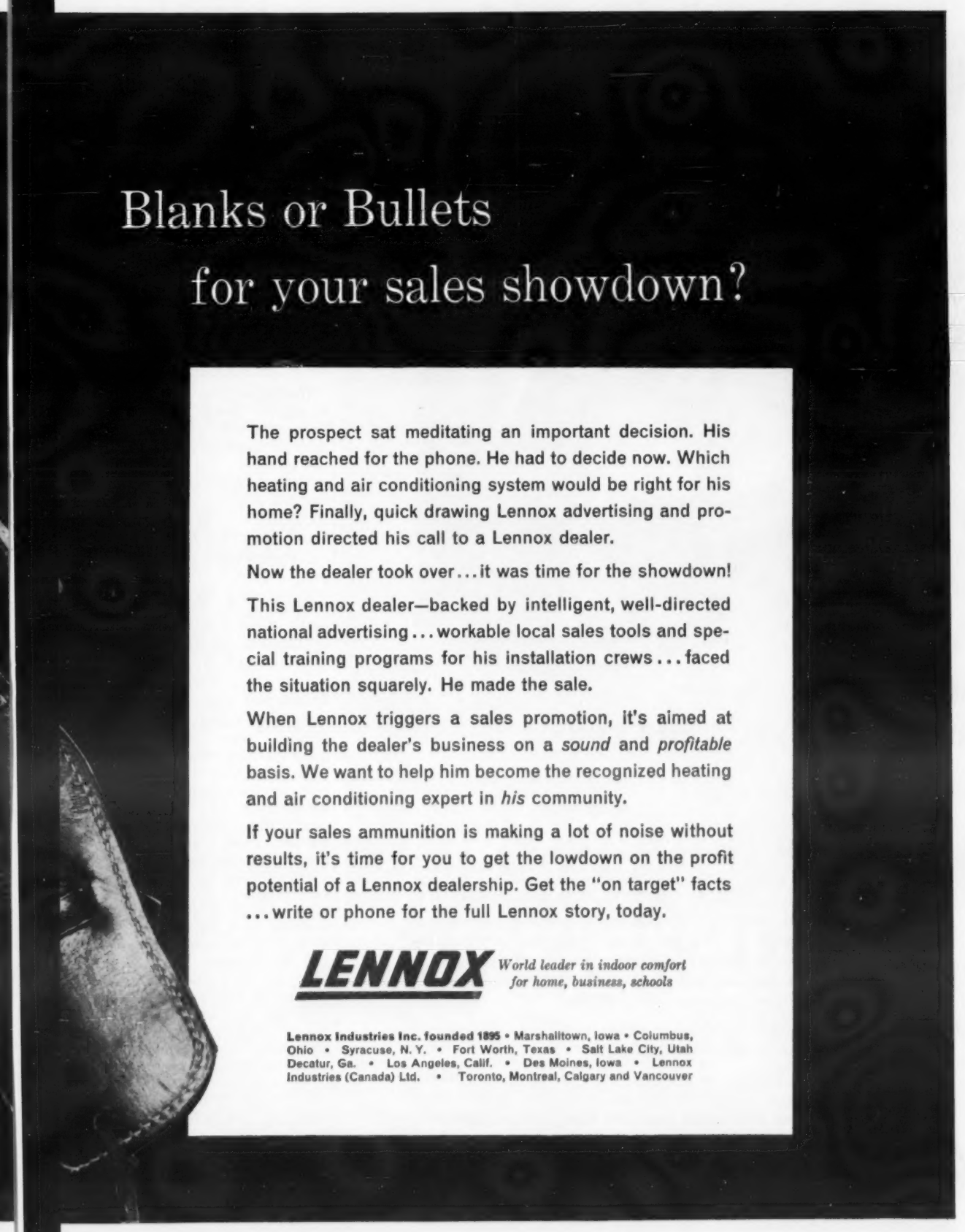
National Housing Center Exhibits Open Through Sept.

WASHINGTON, D. C. — A completely refurbished New Products Exhibit will go on view at the National Housing Center July 11, and will remain on display through the month of September, 1960.

Innovations in the American standard of home construction and equipment have been selected by the New Products Review Committee of the National Housing Center.

Letters have been sent to more than 20 manufacturers accepting, as eligible for exhibit, such products as nylon injection-molded grilles, a new automatic air purifier, a built-in ventilating system, and a wall vent heater.

The National Housing Center is located at 1625 L St., N.W., in Washington, D. C. Admission is free and the Center is open 10 to 6 p.m. daily and 1 to 6 on Sundays.


Blanks or Bullets
for your sales showdown?
The prospect sat meditating an important decision. His hand reached for the phone. He had to decide now. Which heating and air conditioning system would be right for his home? Finally, quick drawing Lennox advertising and promotion directed his call to a Lennox dealer.
Now the dealer took over... it was time for the showdown!
This Lennox dealer—backed by intelligent, well-directed national advertising... workable local sales tools and special training programs for his installation crews... faced the situation squarely. He made the sale.
When Lennox triggers a sales promotion, it's aimed at building the dealer's business on a sound and profitable basis. We want to help him become the recognized heating and air conditioning expert in his community.
If your sales ammunition is making a lot of noise without results, it's time for you to get the lowdown on the profit potential of a Lennox dealership. Get the "on target" facts ...write or phone for the full Lennox story, today.
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Lennox Industries Inc. founded 1895 • Marshalltown, Iowa • Columbus, Ohio • Syracuse, N. Y. • Fort Worth, Texas • Salt Lake City, Utah Decatur, Ga. • Los Angeles, Calif. • Des Moines, Iowa • Lennox Industries (Canada) Ltd. • Toronto, Montreal, Calgary and Vancouver

Inside Dope

By GEORGE F. TAUBENECK

(Continued from Page 1)

mind envisioned the future of American architecture.

"If a fragile bird cage can bear that heavy book, why couldn't a steel frame hold up a building?" he reasoned.

A building's weight could be supported by its frame, not its walls! Walls need be nothing more than a "curtain" to keep weather out and people inside!

William Le Baron Jenney molded his vision into the concrete reality of Chicago's 12-story Home Life Insurance building, the first steel-frame "curtain wall" skyscraper the world had ever seen.

One more invention was needed, or the skyscraper would be impossible forever. Luckily, that invention arrived.

With an old wagon spring and a new idea, Inventor Elisha Otis demonstrated his "elevator" to the applauding crowds of New York's Crystal Palace 'way back in 1853.

First elevators were primitive . . . a long cable with a car at one end and huge iron bucket on the other. Fill the bucket with water and the car went up!

But the elevator came to stay. It was mated to the idea of steel frame construction, and their marriage gave birth to the skyscraper.

Grandparents of the Skyscraper

The skyscraper had "grandparents," too: American ingenuity and the high cost of city land.

Imagine how much higher our cost of living would be today if business offices could *not* be concentrated in a tight metropolitan area—if a building's limit was, say, six stories.

With the sky the goal, the race was on. The Singer building soared to 41 stories in 1907. Following year the Metropolitan Life Tower climbed to 52. In 1913 the Woolworth building nibbled the clouds at 60 stories!

Yet, these buildings were not really "modern." They did not follow the clean-cut lines of Louis Sullivan and his "Chicago school."

They were overloaded with ornamentation borrowed from long-dead eras—sugary baroque, collegiate Gothic, banking house classical, and Early American railway station.

What had happened? At Chicago's World Columbian Exposition in Chicago in 1893 the "old guard" had counterattacked Jenney's and Sullivan's newfangled ideas with acres of buildings heavily-laden with grandiose "period" monstrosities.

In 1930 the New York Daily News building and the Philadelphia Savings Fund Society Bank were among the first skyscrapers to recapture the straightforward lines of the 1880 innovators.

The Sixth Wall Street Tower, the Empire State building, Rockefeller Center—all were landmarks in the revolt against the "sugar-coated" skyscraper in the trend back to the elegant simplicity of that earlier day.

Floating Cliffhangers

Following World War II, the United States became the center of an architectural renaissance. The skyscraper at last dared to rely completely on the steel frame.

Some of these new frames even raised whole buildings off the ground—seemingly to float on air—with gardens growing underneath them.

No longer rising straight up from the sidewalk — making gloomy and sunless canyons out of city streets—these new skyscrapers created glistening glamours of glass and stainless steel which roseated in the sunlight.

What will the future bring? Ski lifts enclosed in clear plastic connecting the tops of our skyscrapers? Whole cities protected by walls and ceilings of plastic, glass, and steel?

Ah, New York! It's wonderful.

Add Newspaper Boners

Poll Shows Nixon Will Run Behind John in Indiana.—*Columbia Basin News.*

Bing, Debbie, Bob in Cast of Broad's Next Feature.—*Columbus Dispatch.*

Demos Lash Nixon Seat at Summit.—*Harrisburg Patriot.*

Death of Newlyweds Orphans 8 Children. — *Norfolk-Ledger-Dispatch.*

Joy Income Shows Gain For Quarter. — *Pittsburgh Post-Gazette and Sun-Telegraph.*

Stories of the Week

Accompanying a birthday gift from a sixth-grader, this note:

"To Nancy, with all my allowance."

Uncertainly a conventioneer wandered down to dockside. Policemen were playing a spotlight on some sort of activity in the river.

"Whass goin' on here?" demanded Joe.

"Trying to find a drowned man," grunted a copper.

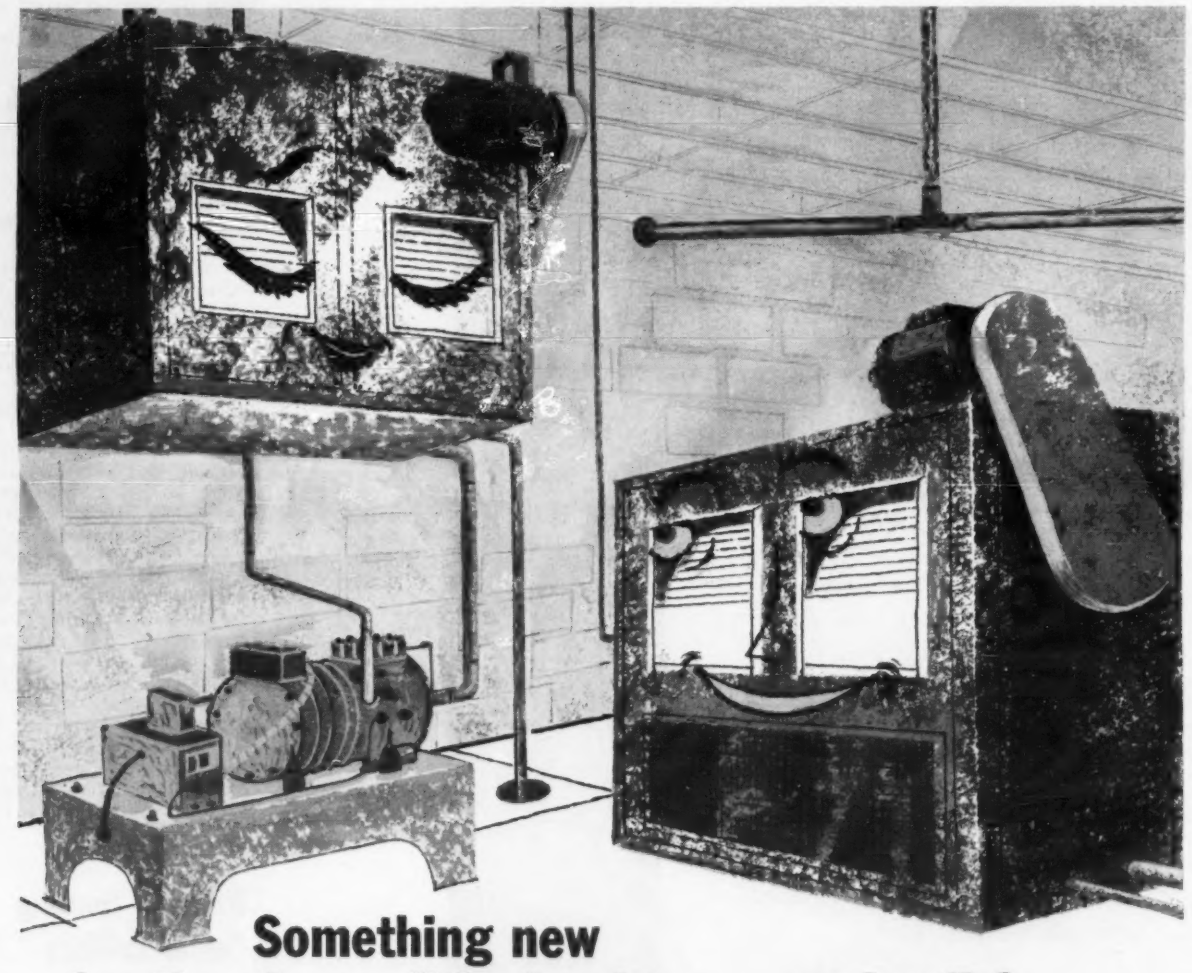
"No kidding? What do you need one for?"

"What's the first thing you notice about a girl?"

"Depends on which direction she's facing."

Quote of the Week

No man has ever been independent; every man has leaned upon the past. Every liberty we enjoy has been bought at the cost of martyrs' blood; every achievement of the race has been made at the cost of incredible toil. There is not a privilege nor an opportunity that modern society grants to us that is not the product of other men's labors. We drink every day from wells we have not dug; we warm by fires we have not kindled; we live by liberties we have not won; we are protected by institutions we have not set up. Our churches are built upon rocks put in place by martyrs of the ages past. Our government rests upon the foundations cemented in place by the blood of soldiers who tracked their way, barefoot thru icy battlefields or over burning sands. Our courts are reared upon the bodies of those who died for freedom. No man liveth unto himself; all the past has invested in him.—ROY L. SMITH.



Something new for the air conditioning boys...and coils!

Now, Air Handlers from Halstead & Mitchell in 880 to 47,500 CFM Range

AH Series Air Handling Units

Before you buy any Air Handler, check and compare these new H&M units, feature for feature and price for price.

See how easily H&M Air Handlers accommodate matching cooling and heating coils, with space for up to 12 rows of coil depth overall! If you like, H&M coils (from 2 to 68 square feet of face area) can be factory-installed, leaving protruding connections on either side for easy hook-up. Halstead & Mitchell makes the coils you need to match: direct expansion, chilled water, hot water, standard or non-freeze steam. Filter sections are also available.

Performance? H&M Air Handlers deliver air against static loads up to 2-inches water gauge, and do it quietly.

Construction? They're the sturdiest units in the field. Forward curved centrifugal blowers are enclosed in a heavy gauge cabinet featuring formed steel corner posts and flush mounted panels.

Price? Just ask your H&M distributor. You'll be pleased. He has all the engineering information, too. Or, you can write for Bulletin AHU-100, Halstead & Mitchell, Bessemer Building, Pittsburgh, Pa.

HM Halstead & Mitchell

Air Handlers • Finned Coils • Air-Cooled Condensers • Cooling Towers • Water-Cooled Condensers

Festival of Flame

To Parade 200 Newest Developments for Gas Industry Oct. 9-12, All Gas Air Conditioner, Refrigerator Makers Asked To Exhibit

ATLANTIC CITY, N. J.— More than 200 of the newest and most significant technical developments in gas utilization and gas industry operation will highlight the "Festival of Flame" exhibit at the American Gas Association's 42nd annual convention Oct. 9-12 in Atlantic City, the AGA announced

Twice as large as the "Parade of Gas Progress" exhibit presented at the 1958 convention, AGA's dramatic "Festival of Flame" will occupy the entire 90,000-sq. ft. exhibition hall of Atlantic City's newly-renovated Convention Hall.

Christy Payne, Jr., chairman of the Exhibit Planning Committee and manager of market development for The Consolidated Natural Gas System, reports some 100 new developments by nearly 50 manufacturers and gas companies already have been qualified and signed up for display in the 1960 exhibit.

More than a score of additional gas utilization advances and nearly 100 items of gas operating equipment also are expected by convention time.

Centerpiece of the exhibit will be a spectacular 30,000-ft. ft. mall-type educational display, arranged by AGA's Operating Section, it was pointed out. Exhibitors will show the newest and most important equipment and control devices used in every area of gas operations, from the producer's wellhead to the customer's burner.

The gas utilization section of the "Festival of Flame" will focus industry attention on significant new technical developments in residential, industrial, and commercial gas equipment and appliances which have become commercially available since October, 1958, or which have become prototypes or field test models since that date.

Payne adds that certain equipment categories—gas air conditioners, refrigerators, infrared burners, and gas disposers—have been deemed so important to the industry that each manufacturer in these fields has been invited to exhibit one of his latest and most advanced models.

A number of gas utility companies have been invited to show significant new developments they have introduced for their own use, including appliances, systems, methods and procedures, tools, and special devices.

The "Festival of Flame" also will include a "Festival of New Freedom Gas Kitchens and Laundries," which will flank both sides of the exhibition hall.

A special gas "patio" on one side of the exhibition hall's main entrance will show delegates the newest outdoor application of gas, including infrared heating. Gas luau torches will ring the patio, and scores of modern gas lights will illuminate the five main "streets" of the "Festival of Flame."

Exhibits representing a cross-section of gas research projects conducted under AGA's PAR Plan (Promotion, Advertising, and Research) will be featured in a 2,000-sq. ft. area opposite the gas patio near the exhibition hall entrance.

The grand opening of the "Festival of Flame" has been set for noon Sunday, Oct. 9. The exhibit will be open to delegates and guests daily from noon to 5 p.m. through Oct. 12.

The convention officially opens Oct. 10, according to Marvin Chandler, chairman of the General Convention Committee and president of Northern Illinois Gas Co. The first general session is slated for 9:45 a.m.

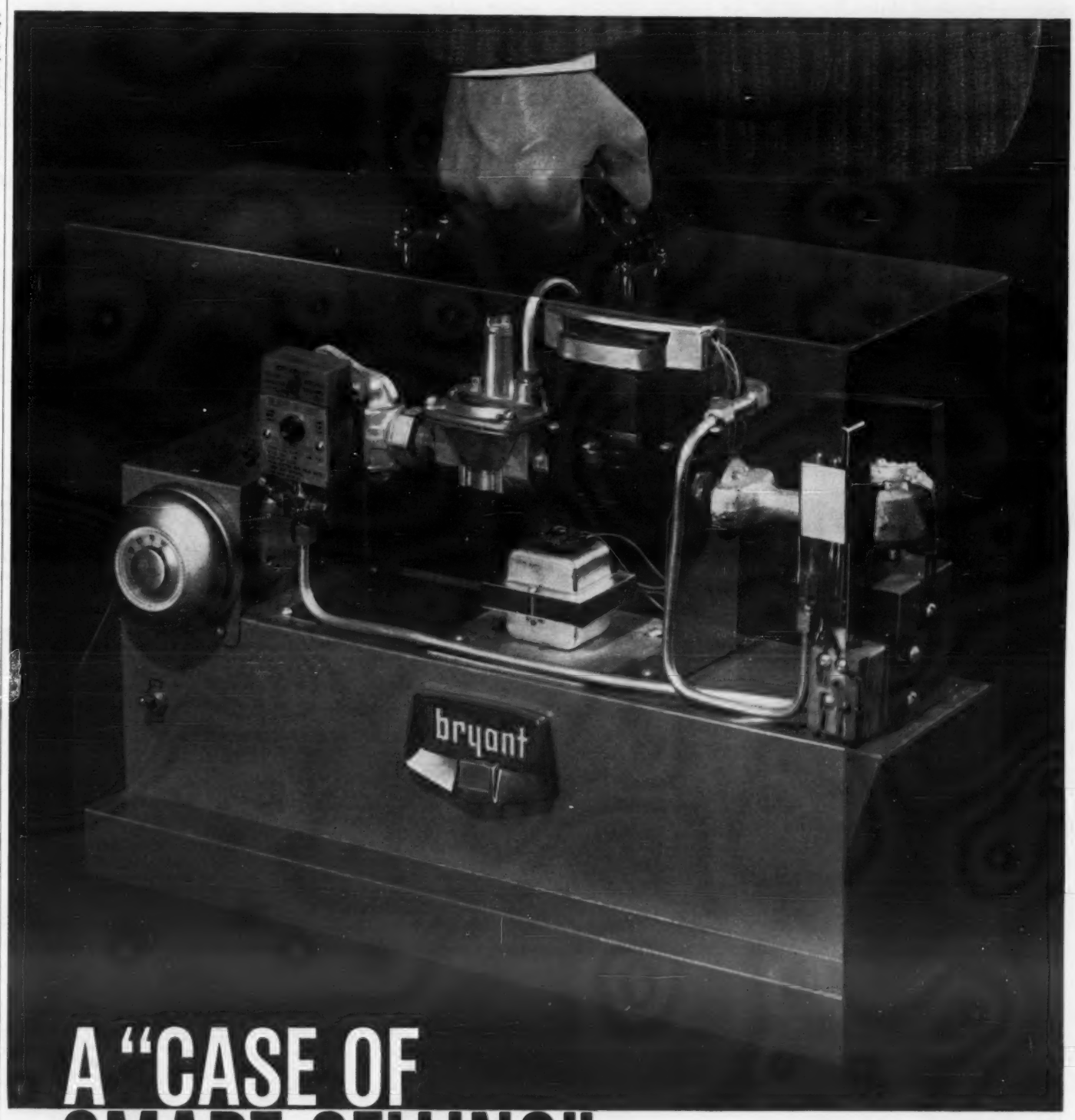
Following the convention theme, "The Soaring Sixties—Decade of Opportunity," nearly a dozen industry and guest speakers will address an estimated 5,000 delegates during the three morning sessions and a final luncheon meeting.

SEND FOR REPRINTS
"SERVICE MAINTENANCE CONTRACTS AND AVERAGE CHARGES FOR SERVICE PARTS AND OPERATIONS."
Only 50¢ each.
For your copy, clip this ad and mail with name and address to: Air Conditioning, Heating & Refrigeration News, 450 W. Fort, Detroit 26, Mich.

Pickett Takes Over Raleigh Dealership

RALEIGH, N. C. — Sale of Smith-Barnes Co., local heating and air conditioning dealer, was announced recently by Gordon Smith, Jr., former manager.

The new management is headed by Floyd R. Pickett of Raleigh. Smith-Barnes and its predecessor, Nicholson, Inc., have been a Chrysler Airtemp dealer since 1948, it was pointed out.



A "CASE OF SMART SELLING"....*worth looking into!*

You're "looking into" an exclusive Bryant selling help—The Bryant Furnace Demonstrator. With it, you can put on a "live" demonstration that shows how Bryant controls and burner work. Prospect "demonstrates to himself"— sells himself. It takes "price" and "we're not ready to buy" right out of the picture. Our dealers tell us that they're closing more sales on the first call and getting their price. Demonstrator works fine on boiler sales, too—Bryant controls are used on all Bryant products! Why not look into this "case of smart selling" and a dozen other reasons you'll be better off with Bryant. Call your Bryant Distributor or Branch today. Bryant Manufacturing Co., Indianapolis, Indiana. Bryant Manufacturing Ltd., Toronto, Ontario.

bryant

Amps-Horsepower-Btu

Battle of Ratings Raises Problems For Manufacturers and City Inspectors

By Frank J. Versagi

The battle over the proper rating of refrigeration cycles goes on. While, due in great part to NEWS editorializing, a certain degree of uniformity has been achieved in the rating of air-cooled air conditioners, there are still manufacturers who continue using the old water-cooled rule of thumb that 3 hp.=3 tons or 36,000 B.t.u.

The recent practice of no longer listing horsepower on hermetic compressors, but listing full load running amps instead has added to the confusion at license and permit-getting end.

The problem is stated by one manufacturer: "Only three manufacturers are facing up to admitting the higher horsepowers typical of air-cooled equipment. Horsepower has been so badly misused as to be virtually meaningless."

From the viewpoint of the licensing authority of a major city: "Electrical motors driving refrigerating compressors are appearing in the field with no horsepower rating indicated on the nameplate. Since permit and license fees, contractors and operator limitations, and other administrative features of the regulations pertaining to refrigeration equipment are predicted on horsepower, it is desirable that this criterion be maintained for the sake of uniformity."

Since horsepower has been so abused as to be meaningless, what can be used for a fair basis of checking and comparing units? asks a manufacturer in a product bulletin to its own distributors. The company's answer: "Capacity and compressor power input at rating conditions; but since watts are not frequently published, compressor nameplate or running amps provide a practical basis for comparison."

When nameplate amps are converted to horsepower, of course, the equivalent horsepower rating is always higher than the misleading ton-equals-horsepower comparison would indicate. A 5-ton air conditioning unit, for example, will frequently calculate to 6-7-8 hp. when the nameplate amps are converted. Especially true of

* * *

Table 1—Motor Ratings for Refrigerating Equipment
(Used by a city licensing authority)

SINGLE PHASE A.C.

Hp.	Nameplate Current Rating — 115 V. —	— 230 V. —
⅙	4.4 to 5.1	2.2 to 2.6
¼	5.2 — 6.5	2.7 — 3.3
⅓	6.6 — 8.0	3.4 — 4.3
½	8.1 — 11.8	4.4 — 5.9
¾	11.9 — 14.9	6.0 — 7.5
1	15.0 — 18.0	7.6 — 9.0
1½	18.1 — 22.0	9.1 — 11.0
2	22.1 — 24.0	11.1 — 14.5
3		14.6 — 19.8
4		19.9 — 25.3
5		25.4 — 30.4
6		30.5 — 35.2
7		35.3 — 38.8
7½		38.9 — 41.0
8		41.1 — 44.0
9		44.1 — 48.0
10		48.1 — 50.0

THREE PHASE A.C.

Hp.	Nameplate Current Rating — 220 V. —	— 440 V. —
½	2.0 to 2.4	1.0 to 1.2
¾	2.5 — 3.2	1.3 — 1.6
1	3.3 — 4.3	1.7 — 2.2
1½	4.4 — 5.8	2.3 — 2.9
2	5.9 — 7.8	3.0 — 3.9
3	7.9 — 10.5	4.0 — 5.3
4	10.6 — 13.5	5.4 — 6.8
5	13.6 — 16.4	6.9 — 8.2
6	16.5 — 19.2	8.3 — 9.6
7	19.3 — 21.3	9.7 — 10.7
7½	21.4 — 22.5	10.8 — 11.3
8	22.6 — 24.0	11.4 — 12.2
9	24.1 — 26.0	12.3 — 13.4
10	26.1 — 28.3	13.5 — 14.6
11	28.4 — 30.9	14.7 — 15.8
12	31.0 — 33.5	15.9 — 17.0
13	33.6 — 36.1	17.1 — 18.2
14	36.2 — 38.7	18.3 — 19.4
15	38.8 — 41.2	19.5 — 20.6
16	41.3 — 43.6	20.7 — 21.8
17	43.7 — 46.0	21.9 — 23.0
18	46.1 — 48.4	23.1 — 24.2
19	48.5 — 50.8	24.3 — 25.4
20	50.9 — 53.2	25.5 — 26.6
21	53.3 — 55.6	26.7 — 27.8
22	55.7 — 58.0	27.9 — 29.0
23	58.1 — 60.4	29.1 — 30.2
24	60.5 — 62.8	30.3 — 31.4
25	62.9 — 65.4	31.5 — 32.7
26	65.5 — 68.2	32.8 — 34.1
27	68.3 — 71.0	34.2 — 35.5
28	71.1 — 73.8	35.6 — 36.9
29	73.9 — 76.6	37.0 — 38.3
30	76.7 — 79.3	38.4 — 39.7

Table 2—Air-Cooled Units

	ARI B.t.u.	Compressor *Nameplate Amps @ 230 Volts Single Phase	Claimed Hp.	Amps Per Claimed Hp.
3 Ton Self-Contained Units	35,000	22.5	3	7.5
	37,000	25.0	3	8.3
	34,000	20.0	3	6.7
	36,000	21.1	4	5.3
	36,000	21.0	3	7.0
3 Ton Condensing Units	36,000	22.1	3	7.4
	38,000	25.0	3	8.3
	36,000	20.0	3	6.7
	36,000	21.1	4	5.3
	36,000	21.0	3	7.0
5 Ton Condensing Units	61,000	31.0	5	6.2
	54,000	28.0	5	5.6
	60,000	31.5	5	6.4
	58,000	32.0	6	5.3
	58,000	31.5	5	6.3

*This is the most universally available figure and will usually be stamped on the compressor nameplate.

Although it is not as readily available, a more accurate figure would be running amps.

(Manufacturers' Model Numbers have been deleted from this table.—Editor)

from Honeywell... ANOTHER DIAMOND JUBILEE PRODUCT

Announcing Honeywell's

New all-in-one control

Existing Air Conditioning Control Systems require the manufacturer to provide two control panels—one at the condensing unit and one at the indoor fan system. This means extra field wiring is needed and that a user must allow for the additional man-hours of work required to supervise two panels.

New Honeywell Control Center Panel includes *all* components necessary to control two- and three-ton air conditioning units and is available from stock. Easier to install, wire and service.

air-cooled equipment, the situation is applicable to a degree to water-cooled units.

"This can make quite a difference in the water charge for the unit, in the cost of the permit, and it can affect the licensing grade of contractors, since they are predicated on horsepower," a City official points out.

"We were happy to get rid of tonnage as a criterion," he continued, "since there was always the dispute caused by the fact that the capacity of a compressor varies with its application—whether it was an air condiitioning job or a low temperature job, say."

Horsepower continues to be an adequate criterion, in the absence of adequate and authoritative B.t.u. certifications, which might be best if they were coupled with safety certification, according to the official.

"To this end, we have developed a motor rating (Table 1) based on the National Electric Code, and this table will be used to determine the horsepower ratings of motors not having this information on their nameplates. The table is to be used only when no horsepower rating is indicated on the motor nameplate. In those cases where motors with no horsepower indicated are encountered with current ratings in excess of the limits set forth in the table, the full load current tables in the National Electrical Code will be used to determine the horsepower rating."

Using a table of its own to compare frequently encountered compressors (Table 2), the cited manufacturer tells its distributors:

"If you face a situation where your competitor is claiming 1-hp. per ton, your best solution is to—

"1) Point out that horsepower has been discredited as an air-cooled rating; use your ARI directory to prove this.

"2) Show how **amps,** the basis on which power supply wire is sized, are very close for the same equipment tonnages as illustrated in Table 2, or compile a table to fit your local competition.

"3) If the prospect is still unconvinced, make an amps-per-claimed horsepower comparison! This puts your competition in the awkward position of having to use as many as 8.3 amps per horsepower whereas we need only 5.3—up to 36% less."

The company goes on to insist that understating horsepower for competitive reasons hurts the entire industry two ways:

"1) Poor installations are poor public relations. If the electrical contractor installs according to the claimed, but understated, horsepower, he may not put in enough copper to provide adequate power for the equipment. Undersized power lines can mean too little juice to the compressor at the very time when the equipment is loaded to the hilt and comfort air conditioning is needed most.

"2) Nuisance calls aggravate everyone. Low-claimed horsepower can also lead to undersizing of protective equipment which may cause nuisance fuse blowing or circuit breaker trips.

"Help yourself by helping the industry face up to the fact that it is going to have to provide for the **amps** necessary to give the **B.t.u.** needed for comfort cooling—regardless of the fact that some manufacturers are ducking the issue by publishing misleadingly low horsepower claims," the company concluded.

Hi-Press Appoints Secord Sales Mgr.

NEW YORK CITY—Appointment of I. B. Secord as national sales manager of the Commercial & Industrial Div. of Hi-Press Air Conditioning of America, Inc. has been announced by S. W. Brown, president.

I. B. Secord

Secord comes to Hi-Press after five years as national sales manager and application engineer for Drayer-Hanson. He has been active in air conditioning sales since 1948, when he left George Washington university where he studied mechanical engineering.

Secord will be in charge of the company's new sales and promotional campaigns for land-based applications of the Hi-Press system.

Said to be a leader in the marine field, this system is now beinf offered for industrial and commercial use.

Hi-Press is a system of air conditioning in which the treated air is distributed at high velocity through prefabricated, small diameter piping instead of ductwork, it was pointed out.

This system already has been installed on, or is on order for, more than 500 ships built throughout the world, according to the announcement of the company.

Childers Manages Room Air Conditioner Sales for Kelvinator

DETROIT—George H. Childers has been named manager of room air conditioner sales for Kelvinator Div. of American Motors Corp., it was announced by E. B. Barnes, general sales manager.

G. H. Childers

Childers joined Kelvinator after two years with Airtemp Div. of Chrysler Corp. where he was general manager of the room air conditioner department.

Acme Names Furvinal To Engineering Post

JACKSON, Mich. — Appointment of Maurice A. Furvinal to the newly-created post of chief project engineer at Acme Industries, Inc. has been announced by Henry R. Krueger, director of engineering.

M. A. Furvinal

Furvinal, who was an engineer with Acme from 1948 to 1952, rejoins the company after serving as an air conditioning design engineer with the Coleman Co., Inc. since 1954.

panel for central air conditioning

New R8100 Complete Control Panel

- **COMBINES TRANSFORMER, single or two-speed fan relay and 18 or 25 amp contactor in a single unit**
- **MODELS AVAILABLE with time delay, reset and heat pump changeover relays**
- **UNIQUE, one-screw pressure control mounting**
- **SIMPLIFIES MANUFACTURER'S production lines**
- **SAME PANEL for self-contained and split systems**
- **PRE-WIRING and mounting at factory**
- **COSTS LESS than existing split control systems**

Now, whether you manufacture, sell, install or maintain air conditioning systems, you'll pocket *extra* profits by handling this new, all-in-one control panel.

Manufacturers. You can simplify your furnace line and eliminate special transformers, special wiring harnesses, special provisions for adding fan relays, and special dealer instructions. Models available from stock. No special assembly charge for small orders.

Electrical Contractors and Dealers. You'll cut down on costly field time with simplified installation procedures that eliminate indoor fan-center panels. What's more, *transformers can't burn out!* New UL transformer-thermostat wiring makes secondary shorting impossible.

Dealers and Distributors. You can now receive complete control systems mounted and prewired by your manufacturer—thus simplifying your inventory and easing your replacement problems.

The Honeywell R8100 is the most versatile panel ever developed for air conditioning control—and new, lowest-ever prices are an additional *plus*-feature. Ask your Honeywell man about the new R8100 as well as the R8101 and R8102 variations; or write: Minneapolis-Honeywell, Dept. AN-7-51, Minneapolis 8, Minnesota.

Honeywell

First in Control

SINCE 1885

75th YEAR — ENGINEERING THE FUTURE

Split-Level Homes In Texas Feature Heat Pump

TEXAS CITY, Texas — New split-level homes in the Freeway Park development here are being heated and cooled by 2 and 3-ton Carrier packaged heat pumps.

Builder David A. Evans is using the heat pump as a major selling point for his all-electric Gold Medallion homes. He sold 15 homes the first month, including five the first day, and has maintained a two-a-week pace since.

Two model homes have been built without year-round air conditioning. They are equipped with Carrier gas-fired furnaces and provision for future air conditioning. However, Evans reports, these have not sold as well as the other models.

Homes Priced from $14,600 to $18,700

The homes, designed to resist high winds from the Gulf of Mexico through the use of large areas of sloped roofing, contain three or four bedrooms. They are priced from $14,600 to $18,700, with most selling for about $17,000.

The homes also feature garbage disposal units, full carpeting in living rooms, food centers with built-in blenders and other devices, 6-in. insulation, two-car garages, and electric clocks.

Heat pumps are located outside on a concrete slab and take return air from a duct running from a center hallway through the bottom of a downstairs bedroom closet. The raised floor of the closet has been made into a convenient shoe rack.

A supply air duct extends from the top of the closet into a center hallway where sheet metal ducts which run the length of the house are concealed by a lowered ceiling. Air is distributed to rooms horizontally through high grilles.

Two-Ton System Installed for Less Than $1,000

A 2-ton system is installed for less than $1,000 by Carrier dealer Moore-Climatic, Inc., of which W. K. Walters is Texas City branch manager and Kenneth Shelton of Galveston is president.

To call attention to his project, Evans raised a promotional fund of $27,000 to which all his national brand suppliers contributed.

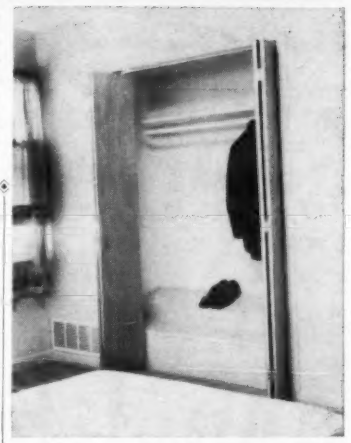
He started his advertising program with 2-in. teaser ads in newspapers, announcing, "The split levels are coming." He gradually expanded this to large display advertisements, and finally erected signs on highways leading to Texas City.

Some 11,000 persons inspected the houses on the opening weekend, when Evans suppliers turned out to help. About 35 persons staffed the model homes.

During the first three weeks, 30,000 individuals visited the site. Development plans call for an eventual 1,600 homes with several builders participating.

W. E. Verkin of Texas City is planning $12,000 houses, half containing Carrier heat pumps and half including Carrier gas-fired furnaces with provision for adding central cooling.

TWO-TON HEAT PUMP is installed at the side of this house in Freeway Park, Texas City, Texas. The Carrier self-contained unit takes air from the interior of the house through a lower duct and discharges it through a duct just above.



HANDY RACK FOR SHOES is the result of a return air duct running through the bottom of the closet from a center hallway in this Freeway Park house built by David A. Evans. This and other all-electric Gold Medallion homes in the development are cooled and heated by Carrier heat pumps installed by Moore-Climatic, Inc.

for
THERMAL PROTECTION
"there's nothing like
G-B DUCT"— the proven "prefab" glass fiber duct! See full details on page 30.

"Zephyr"-25 "Zephyr"-50

New "Zephyr" containers for "Freon" —lighter in weight, easier to handle

These new "Zephyr" containers for "Freon" refrigerants are shorter, wider, lighter—so much easier to handle that a 50-lb. size is now practical. You can use them upright or inverted without special blocks or stands . . . stack them one on top of the other . . . stand them upright in your truck.

A permanent collar not only protects the valve, but also serves as a built-in carrying handle. And no wrenches are needed, because these new containers also have a new-type handwheel valve. Both "Freon-12" and "Freon-22", the premium-quality refrigerants, are available in these new Du Pont "Zephyr" containers.

New top and valve for standard 25-lb. cylinders

Now, Du Pont's new "Spintop", for standard 25-lb. cylinders, combines a convenient carrying handle, valve protector and stand, all in one. Free to rotate, the "Spintop" provides easy access to the valve. And the valve itself is a handwheel type that includes a special, spring-loaded pressure relief valve for added safety.

Complete family of containers* for "Freon" refrigerants includes the new "Zephyr" types; standard 10, 25 and 145-lb. containers; and the new "Spintop" cylinder. Your *leading* air-conditioning and refrigeration wholesaler stocks the type that suits your needs best. Call him today for your order of "Freon" refrigerants.

**1- or 2-lb. "Can-O-Gas" containers of "Freon" refrigerants are available from the Virginia Smelting Co., our nationwide sales agent and authorized repackager.*

DU PONT
REG. U.S. PAT. OFF.

BETTER THINGS FOR BETTER LIVING . . . THROUGH CHEMISTRY

FREON®
premium quality
refrigerants

Nullifies Effect of Temperature Extremes

Perimeter Heating, Air Conditioning Protects Artificially Stored Shrubs

BOWMANVILLE, Ont., Can. —A perimeter heating and air conditioning system is successfully protecting thousands of dollars worth of artificially stored shrubs from freezing temperatures and spring warm spells at the Brookdale-Kingsway Nurseries, Ltd. here.

Norman J. Scott, general manager, reports that not a single shrub has been lost through freezing since the installation two years ago.

Prior to that time, Scott's operation was at the mercy of the temperature during four or five critical months of the year. Prolonged freezes could kill artificially stored dormant shrubs.

On the other hand, premature spring warm spells would force the nursery to ship out carloads of delicate shrubs that had to be put into the ground.

During such periods, "we practically lived on our nerves," commented Scott. "Any sudden change or drop in temperature sent us running around in the middle of the night starting up fans, space heaters, lamps, etc."

Brookdale - Kingsway Nurseries grows most of its plants on its own acreage. Plants selected for sale to other nurseries and private buyers are left in the ground until fall.

With the first frost, the sap falls to the roots. Then the plants are said to be dormant or "asleep." At this time they are lifted from the ground and stored on hundreds of feet of wooden racks in the quonset "cellar" of the nursery. Their roots are buried in shingle shavings.

Left in their natural surroundings, the plants' roots are protected by the covering of earth. They remain dormant until the spring thaws.

Artificially stored plants, however, required rigid temperature control, relatively high humidity, and air circulation.

"There is a great deal more to learn about the 'sleeping' of artificially stored plants," declares Scott. "But this much we do know.

"If the temperature in store rooms goes above 38° F. or below 34° F. for any prolonged period, we are in for serious trouble. We are also in trouble if relative humidity gets much below 70%. If air is not changed frequently, we face the loss of the bulk of our stock through mold formation."

An idea of the financial risk involved is indicated by the fact that No. 1 Rose bushes are valued at $12,000 per rack. And there are rack after rack of these in nursery store rooms. Loss of a storage cellar's contents might run to $1 million.

After considerable searching to find a heating engineer who would even tackle his problem, Scott met Lorne Kleinstiver, who felt he could handle it. Kleinstiver worked out a perimeter warm air heating system with humidifier and mechanical refrigeration unit to provide cooling when necessary.

A Clare Hecla 250,000 B.t.u.h. furnace was set up on the second floor of the quonset cellar and ductwork was run along outside walls. Hot air was directed downward along the walls.

Thermostats were installed at known cold spots in the cellar. They were connected to motorized valves designed to feed warm air to these areas.

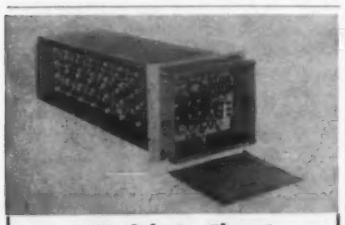
A constant supply of fresh air was also brought in.

To avoid damaging the building through collection of condensation, an inner wall was installed, leaving a 4-in. dead air space between inner and outer walls.

Judicious use of the refrigeration system during the spring enables the nursery to hold plants longer in dormant stage."

TENS OF THOUSANDS of dollars worth of dormant rose bushes are stored in the quonset cellar at Brookdale - Kingsway Nurseries. They demand close control of temperature, humidity, and air circulation for survival.

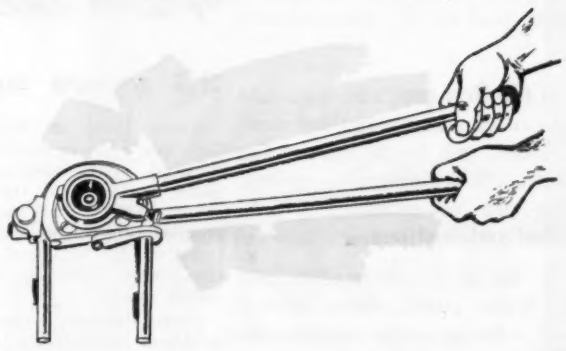
250,000 B.T.U.H. warm air furnace serves perimeter heating system designed to keep storage cellar above freezing during Ontario's cold winters. Refrigeration unit had not been installed when this picture was taken.



• 4 Models In Electric Duct Heater Line
HEAT CONTROLLER, INC.
Jackson, Michigan

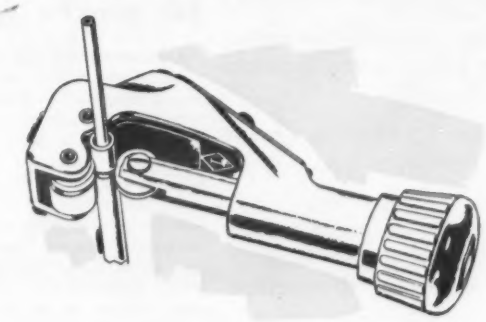
IMPERIAL REFRIGERATION SERVICE

IDEA CENTER



NEW RATCHET HANDLE MAKES TUBE BENDING A PLEASURE

Used in place of handle supplied with lever-type benders for ⅝" O.D. (½" nom.) and larger. Lets you make bends on hard tubing with minimum effort, even in close quarters. As little as 30° handle movement gives new grip so you maintain maximum leverage throughout bend. Ratchet reversing mechanism. Bends made with equal ease from either direction. Sizes ⅝, ¾ and ⅞" O.D. (½, ⅝, ¾" nom.). *No. 366-FR Ratchet Handle.*



"NO SWEAT" METHOD FOR MAKING SWEAT JOINTS ON CAPILLARY AND OTHER TUBING

This handy tool does double duty: it's a tube cutter and also a tube constrictor. Changeover is simple. Just replace the cutting wheel with the roller that's carried in the cutter body and you're ready to go. Constricts large tube until it contacts the smaller tube. Joint is then ready for sweating. Can be used on ⅛ to 1⅛" O.D. tubing. *No. 374-FA Combination Tube Cutter and Constrictor.*

IMPERIAL

MAKE YOUR OWN CHARGING LINES TO ANY LENGTH NEEDED

Save money and get added convenience, too, by making up charging lines that fit your job. Ideal for servicing ice cream trucks or other portable units where longer lines are needed or where standard lengths and standard fittings won't do. Hose has neoprene lining and Buna N covering . . . withstands common refrigerants, abrasion, pressures up to 400 lbs. Fittings are available in four styles; all of them include nut, sleeve and built-in hose support in body.

JACK-OF-ALL-GAUGES — AND IT'S A BEAUTY, TOO!

Here's a multiple-scale, multiple-purpose gauge that you'll use on every job. Exceptionally easy to read. Has white figures and pointer on black dial. Temperature scale — for Freon 12 and 22 — is in red. Pressure reading has been increased to 100 lbs. with retard to 250 lbs. to accommodate higher operating pressures of Freon 22. Vacuum reading: 0 to 30". Furnished in 2½" polished chrome case with ⅛" male pipe thread connection and rear pointer adjustment. Beveled glass. *No. 284-C Compound Retard Gauge.*

THE IMPERIAL BRASS MANUFACTURING COMPANY
6300 West Howard Street, Dept. ACHR-70, Chicago 48, Ill.

Gentlemen:
Send me Catalog No. 82 covering: Compound Retard Gauge, Combination Tube Cutter and Constrictor, Swaging Tool Kit, Charging Hose and Fittings.

NAME.....

COMPANY.....

ADDRESS.....

CITY.....STATE.....

They'll Do It Every Time

by Jimmy Hatlo

OH, BEAMEY, OL' PAL--CAN THESE GO OUT SPECIAL DELIVERY? HERE--HAVE A CIGAR! UH--DO YOU WANT ME TO PAY THE POSTAGE? HEH-HEH--ONE OR TWO OF 'EM ARE PERSONAL....
THERE'S THE PROP CIGAR--OXTAIL IS SENDING OUT THE FAMILY BILLS IN THE COMPANY ENVELOPES AGAIN...
EVERYBODY WORKING HERE IS SECRETARY OF SOME LODGE... THE STAMP MACHINE TAKES A WORSE BEATING THAN MATILDA'S BONGO DRUMS...
HE USED TO JIGGLE MONEY IN HIS POCKET-- BEAMEY THOUGHT HE WAS GONNA GET A TIP....
SHIPPI DEPT
HUH?
THE GUY WHO SOFT SOAPS THE MAIL-ROOM BOYS TO SEND OUT HIS PERSONAL MAIL...
6-10
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Here's How You Can Feel At Home Abroad

SUMMIT MEETING of American industrialists recently revealed interesting attitudes toward the necessity of enhancing and encouraging world trade.

Robert E. Lewis, president of Sylvania Electric Products, for instance, declared that our most serious competition stems from the "industrial rebirth of friendly countries which are engaging in friendly competition with us."

While we can't compete pricewise with some few of these foreign producers, we CAN compensate for the influx of foreign goods, and expand our foreign markets, if we "beef up" our SELLING efforts, he emphasized.

President Ray Eppert of Burroughs Corp. added that employment of tariffs to protect our domestic market is "obsolete" because nations which are courageous enough to associate with us militarily also must be strong to compete with us economically.

"The only answer to this competitive dilemma," he stated, "is to expand the world market. What we need is not a larger slice of the pie, but a bigger pie.

"When we build a fence we must consider what we are fencing in as well as what we are fencing out. If we fence out imports, we are going to fence in our own exports, for it is an unpleasant fact that the world no longer depends upon our products as much as it did a few years ago."

America's cue is to capitalize on our technological superiority and producing capability. Aggressively we should export and SELL "model two" products while importing territories are in a "model one" phase.

Many foreign economies have newer, more modern, more efficient industrial plants than we, plus laborers more easily satisfied than ours. These facts show up on the marketplace.

Hence the European continent (and Australia) will be an increasingly attractive production and distribution base for American corporations whose products cannot be manufactured here and sold competitively and profitably abroad.

"Importing from ourselves" also protects our competitive position on those products sold in the U.S.A. market by European manufacturers. Therefore, the '60's will soar only to the degree that we market knowledgeably at home and abroad.

Our nation should recognize that a world-wide economic revolution, resulting from a complete change in *methods and desires*—on the part of many countries, millions of people, and entire economies—is in progress.

Advertising is the first gun which should be fired in an American campaign to meet this challenge. Much can be achieved, the so-called Summit Conference agreed, through effective use of existing U.S.A. trade and technical publications.

"My personal belief," vouchsafed one leader, " is that trade publications have a great impact not only on every imaginable industrial market in the U.S.A., but also on the corresponding markets of every other country in the world.

"With the fact established that foreign markets apparently are hungry for news of developments in American industry," he continued, "you ought to ask yourself this question: are you doing enough advertising in American publications which you know reach potential markets in foreign countries?

Some of the areas wherein American industry can compete with low-cost imports include:

1. Product design (wherein we've always had the reputation of being superior).

2. Product reliability or dependability (with emphasis on the fact your product will perform exactly according to specifications).

3. Product availability (giving the customer what he needs when he wants it and in the required quantity . . . without waiting for a slow boat with all the usual delays of custom clearance and shipment from port of entry).

Telling this "all three" promotional story best can be done through American-based trade publications—which enjoy "high saturation" circulation all around the globe.

Prime example: AIR CONDITIONING, HEATING & REFRIGERATION NEWS, which has actively loyal buying subscribers in 83 nations all around the globe.

AN INTERNATIONAL INSTITUTION • SUBSCRIBERS ALL OVER THE WORLD

Trade Mark reg. U.S. Pat. Office: Est. 1926

AIR CONDITIONING HEATING & REFRIGERATION NEWS

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F. M. COCKRELL, *Founder*

'The Conscience of the Industry'

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VOLUME 90, NO. 11, SERIAL NO. 1,633, JULY 11, 1960

From the Files of the News

25 years ago . . .

Kemp hotel in Wichita Falls, Tex. has been completely air conditioned. Suspended-type blower units are used in the individual guest rooms. . . . Four new commercial condensing units were introduced by Copeland Refrigeration Corp., including a 2-hp. air cooled model.

Feature of new all-year air conditioners introduced by Savage Arms Corp. is a water-cooled compressor motor, whereby motor heat is absorbed directly by condensing water flow. . . . In building spaces having normal occupancy, air cooling equipment will cost between $1 and $1.50 per sq. ft. of floor space to properly install, estimates a Chicago utility company official. Cost of operation should be between 2 and 5 cents per sq. ft. of floor space for the season.

A Mansfield, Ohio produce house converted an obsolete ice type refrigerator car into a storage room with the installation of Fedders forced draft coolers. . . . Two Temprite tap mechanically refrigerated beer coolers and a similar type of water cooler were installed in Martin's, Inc., swank Chicago spot.

Russ Co. and General Electric Co. jointly issued an educational booklet on "How to Draw a Good Glass of Beer."

President Reuben N. Trane of the Trane Co. introduced a new propeller-type suspended air handling unit for summer cooling or winter heating. . . . Oklahoma Gas & Electric Co. air conditioned its main office building with a Frick system installed by the Tom Dolan Heating Co.

10 years ago . . .

A labor-saving rig to reduce the installation time in free home demonstrations of window air conditioners was introduced by Paley Mfg. Co. It is said to eliminate drilling of holes or use of wood screws, and to cut installation time from two hours to 15 minutes. . . . Admitting that "air conditioning is probably here to stay," the manager of a large Detroit downtown office building said that "window units are a lot of trouble to me" and said that he thought the irritations might be smoothed out if the salesmen would talk with him before they talked with tenants.

Governmental assistance in stopping the practice of ice cream manufacturers and frozen food processors of furnishing refrigeration facilities to retail food outlets was requested by RACCA. . . . Task Force Furnace II, a special Army unit, is currently testing out several pieces of military refrigerating equipment under desert conditions in the California desert.

Fedders-Quigan Corp. filed with the SEC for a new stock issue to finance further expansion of air conditioning equipment. Company's present volume is split 65% automotive and 35% air conditioning. . . . Adapting a rental plan to commercial refrigerator fixtures has helped advance sales for Marshall Sales Co. in St. Louis.

Double glass, "wiping" with air, or ventilation may solve the problem of "How Do You Combat Condensation on Windows at Night in Air Conditioned Home" was the answer given to the above question from a subscriber. . . . Increasingly important role refrigeration is playing in industry illustrated in the "case of the expanding bearings" at the New Departure plant where mechanical cooling of an oil both solved a costly problem in the production of precision bearings. . . . Setting up refrigeration systems to operate at a temperature difference of less than 10° so that proper humidity can be maintained at low operating cost is a feature of new markets established by Weingarten, Inc. in Houston.

A counter display developed by Wolverine Tube to merchandise its individual carton paged tubing, also dispenses Life Savers. . . . A completely stocked "Supplymobile" is being used for calls on its contractor customers by Wisconsin Refrigeration Supply Co., Milwaukee.

OFF THE CHEST

INDIAN SEEKS CHANCE TO WORK, LEARN IN UNITED STATES

National Dairy Research Institute
Karnal, India

Editor:

I introduce myself as one among the multitudes of readers of your esteemed weekly AIR CONDITIONING, HEATING & REFRIGERATION NEWS. I am Mr. R. Balachandran employed as Technical Assistant (Refrigeration) at National Dairy Research Institute, a Government of India undertaking. I am a Science graduate of Calcutta University and I also hold a diploma in Air Conditioning and Refrigeration Engineering and I have nearly four years of practical experience in this line.

As I mentioned in the beginning I am employed as Technical Assistant (Refrigeration) at National Dairy Research Institute and I am in charge of erection, maintenance, and servicing of various refrigeration machines in this institute.

NOT QUALIFIED FOR ORIGINAL RESEARCH

Since this institute is primarily devoted to research, I have been offered facilities to carry out research in my subject. Interested as I am in research, I feel that the knowledge I have gained so far is inadequate to carry out any research work. I have a strong desire to further my knowledge in this faculty before I start any original research.

I have been closely watching the rapid strides with which this industry is expanding in the United States and I am convinced that the facilities for further study and training are immense indeed. I am thinking of joining any one of the American Universities which offer courses in this subject to have further academic qualifications and before joining any college I want to acclimatize myself with the latest developments in the industry by actually working in some reputable firms.

DESIRES POST AS SERVICEMAN, TRAINEE

In your esteemed magazine I noticed so many advertisements under "position available" column. I could not directly apply to these firms because by the time I get a copy of the AIR CONDITIONING, HEATING & REFRIGERATION NEWS it is too late to apply as the magazine comes by surface mail here.

So I request you to kindly recommend or pass on my name and qualification to any of the firms which are putting "ads" in your weekly so that they can select and appoint me as serviceman, trainee, or apprentice and I can have the opportunity to see and study about the latest developments myself. Here I like to mention that I am a young man of twenty-five.

If you require any further details about me I will be too glad to furnish them.

Waiting for the moment to say "thank you" in person,

R. BALACHANDRAN

IMPRESSED BY SPECIAL GAS ISSUE

The Ohio Fuel Gas Co.
Columbus, Ohio

Editor:

I was quite impressed by your May 30 issue and also enjoyed the June 6 editorial.

FRANK J. SYLVIA,
Air Conditioning & Heating Specialist

REFERENCE TO 'CAESAR'S COLUMN' DELIGHTS HIM

360 Furman St.
Brooklyn, N. Y.

Editor:

1. I was astonished and delighted in reading the "Inside Dope" reference to "Caesar's Column" in the June 20 issue of AIR CONDITIONING, HEATING & REFRIGERATION NEWS. I hope that many of your readers will get the point.

2. I first read it while quite a young man browsing through my father's library nearly 60 years ago. I read it again a few years later and I have read it several times since. Although the style may be somewhat archaic, it is indeed a delight.

3. I am afraid that the impress of "Caesar's Column" on a mind so young as mine is somewhat responsible for my taking up engineering and then while still in college having formed one of the first aero clubs in the United States. Our achievements were not great, but were sufficient to cause us to receive letters from both Wright and Curtis threatening infringement suits if we persisted in flying our gliders either with wing warp control or ailerons.

CROSBY FIELD

SCORES UTILITY'S 'SUBVERSIVE' SELLING TACTICS

Climate Control, Inc.
Omaha, Neb.

Editor:

Your May 30 issue of the NEWS was meaty, but many Gas Utilities (especially public owned) are doomed for a disappointing year.

They must learn that merchandising equipment and systems is much different from opening a valve and selling gas. Most utilities do not have the properly qualified personnel to do the job. Creating a position does not mean it is capably filled.

They (the utilities) will make many enemies among the independent contractors, waste much public money and create another wave of confusion in the public mind—unless they approach this market with a long-range and logical plan.

Steamroller tactics geared to a magic number will fail. Whispering campaigns by those with whom they fail to cooperate will bury the pyramids of money and effort spent.

An installing contractor must apply for an installation permit to the Metropolitan Utilities District before installing a new gas furnace. At this time of writing, about three days after the permit is issued, a salesman from MUD contacts our customer and attempts to unsell our job, and sell the Gas Company's system.

What an inexpensive prospect list! Monopolistic? Steamroller? Ethical? Legitimate? I may be committing financial suicide, but never will I willingly submit to subversive methods of doing business!

For one, I would appreciate one of your incomparable editorials on this subject.

ROBERT E. MASON,
President

whether it is

AIR CONDITIONING

OR REFRIGERATION

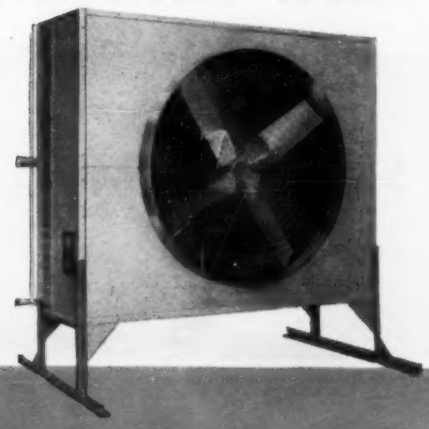
look first to...

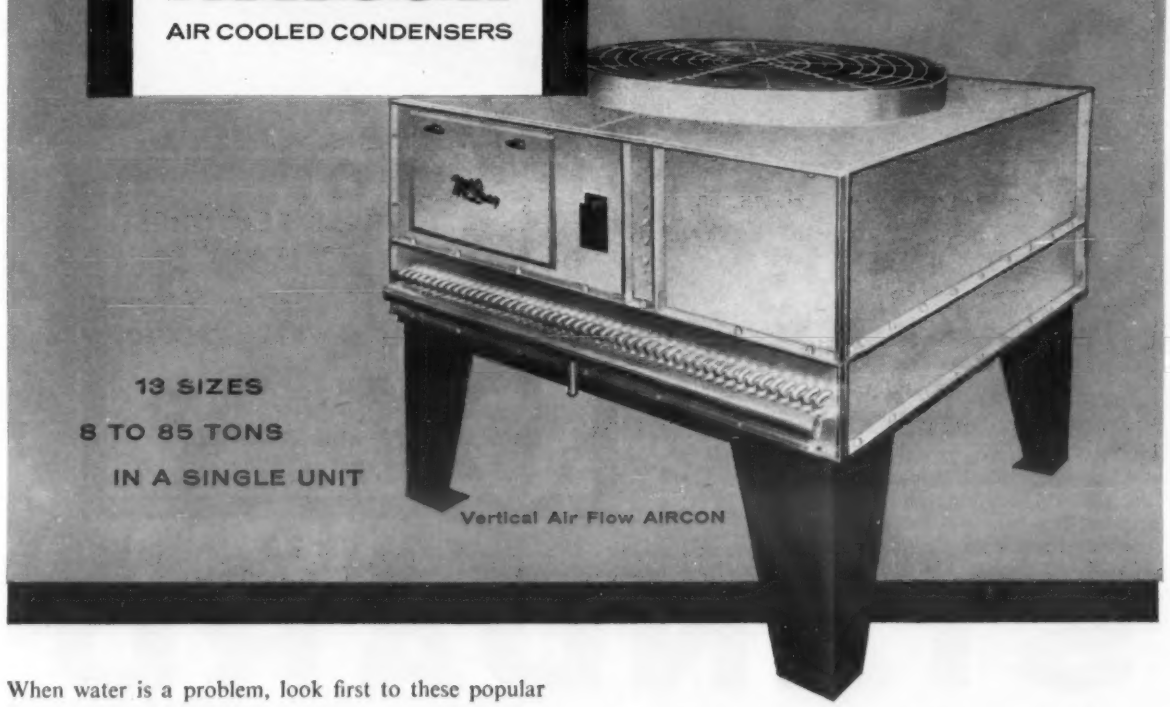
McQuay

AIRCON

AIR COOLED CONDENSERS

Horizontal Air Flow AIRCON





13 SIZES
8 TO 85 TONS
IN A SINGLE UNIT

Vertical Air Flow AIRCON

rigid, heavy gauge construction
for durability and low noise level

When water is a problem, look first to these popular Aircon air cooled condensers. Aircons are suitable for either refrigeration, air conditioning, or both. These heavy duty condensers are built to take it, and are available in horizontal as well as vertical air flow models where their low profile is often desirable. They are available in 13 sizes from 8 to 85 tons in a single unit. Multiple units, of course, enable any desired capacity to be attained, and you can always depend upon McQuay Aircons to do the job—the way you want it done.

Consult your local McQuay representative, or write McQuay, Inc., 1607 Broadway St. N. E., Minneapolis 13, Minnesota.

McQuay INC.

AIR CONDITIONING • HEATING • REFRIGERATION

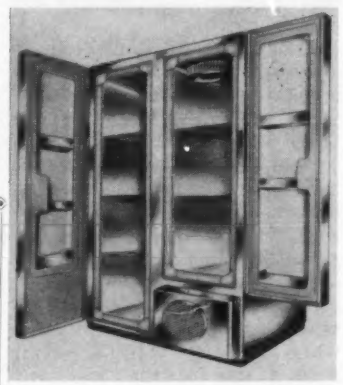
Cap Protects Valve on LP Gas Cylinders

● Adequate protection for the brass valves on liquefied petroleum (bottled gas) cylinders while in service is said to be provided through the use of a new protective cap developed by Pressed Steel Tank Co., Dept. AH&RN, 1445 South 66th Street, Milwaukee 14, Wis.

Designed to screw directly onto the threaded neck of standard LP-Gas cylinders, the protective cap has an open side through which the feed line may be readily connected. The valve itself is easily reached for controlling the flow of gas, according to the company.

for
ECONOMY
"there's nothing like
G-B DUCT"— the proven
"prefab" glass fiber duct! See full details on page 30.

Door Shelves, Circular Blower In Silco Unit



● A new line of "Silco" commercial refrigerators featuring door shelves and a new blower coil of circular design has been announced by Silver Refrigeration Mfg. Corp., Dept. AH&RN, 1469 Utica Ave., Brooklyn 34.

"Door shelves provide up to 30% increase in storage space with no increase in over-all dimensions," the company stated. Three cu. ft. extra per door is now available for storing bottled goods, eggs, dairy products, milk containers, and small canned goods; and frozen food packages in upright freezer models.

Door pans are constructed of one-piece die-stamped aluminum, and anodized in pastel green, according to Silver.

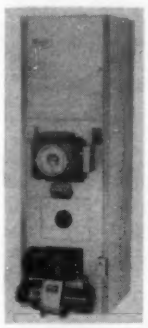
The company said the blower coil features the Silco circular design for air circulation efficiency. Since this coil is only 3½ in. high, extra cubic footage is made available for additional storage space, it was pointed out. Slides and shelves are now interchangeable without the use of tools.

Slides and shelves may be used separately or in combination at the same time.

All models are available in stainless steel exterior and aluminum interior, stainless steel exterior and interior, or white enamel exterior and aluminum interior, it was pointed out.

Dual-Purpose Winter Air Conditioners

● A line of five new dual-purpose "Blue Ribbon" winter air conditioners has been introduced by Thatcher Furnace Co., Dept. AH&RN, Garwood, N. J. The units feature either horizontal or counterflow application.



The air conditioners, model SCO (oil), were designed for horizontal installation on ceilings, in crawl spaces, or attics and are between 20 and 30 in. high depending on the model.

The bonnet output for the new line starts at 90,000 B.t.u. for model SCO-112, which is the smallest, up to 179,000 for the largest. Blower sizes range from 9 in. to 15 in. and c.f.m. from 820 to 2,270.

"The SCO model has a dual-purpose feature," the company said. "It can be used as a horizontal unit with air inlet on the right end as it comes from the factory or changed to left hand in the field simply by rotating the blower 180°. Three sizes can be installed in a vertical position to serve as counterflow units. Thus a dealer can meet two installation applications with an inventory of one unit."

now with ALL COPPER WATER CHANNELS

Shell and Tube
CONDENSERS

HAS ALL THESE FEATURES:
- CLEANABLE
- U.L. LISTED or A.S.M.E. TAGGED
- ¾ TO 15 TON CAPACITY
- SIMPLIFIED and READABLE CAPACITY CHARTS

STANDARD
Assured Dependable Performance Serves You Better!

Standard Condensers are widely known for fine performance and supreme dependability.

Manufacturers of
Liquid Receivers, Adjustable Capillary Valves, Shell and Tube, Shell and Coil, Counterflow and Vertical Condensers.

STANDARD REFRIGERATION CO.
Write for our Catalog

National Distributor for
PRIMORE ROTALOCK VALVES
3535 Fillmore, Chicago 24, Ill.

Virginia Smelting Bows Two Products

● Addition of two products for the refrigeration service and contracting industry — "PH Block"

and a new cleaning solvent containing du Pont's "Freon-11" has been announced by Virginia Smelting Co., Dept. AH&RN, West Norfolk, Va.

The cleaning solvent is recommended for system clean-up following hermetic burnouts. The product is packaged in handy 1-gal. cans and a step-by-step instruction manual for complete reconditioning after motor burnouts is included with each can, the company said.

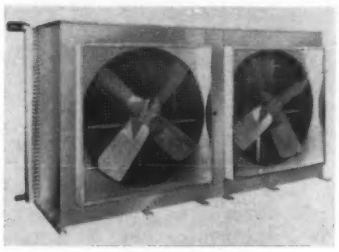
The PH Block has been prepared expressly for acidic water conditions. The manufacturer claims that PH control eliminates troublesome acidic corrosion and maintains proper alkalinity for more effective chemical treatment. A pamphlet containing suggestions as a guide for introducing PH Block treatment is enclosed.

Both of these "Virginia" products can be obtained from refrigeration wholesalers.

Pourable Cement Speeds Bolt Anchoring

● An improved pourable cement, reputed greatly to reduce time required for securely setting anchor bolts, was announced by National Asphalt Corp., Dept. AH&RN, Brooklyn Station, Cleveland 9.

Offered under the trade name "Nacor Anchor Bolt Cement," it is furnished in powder form. "Mixed with water, it becomes semi-fluid, easy to pour or trowel," the company said. "Applied around a bolt, it bonds itself firmly to both bolt and hole surfaces." It is claimed to set in 10 minutes with virtually no shrinkage.

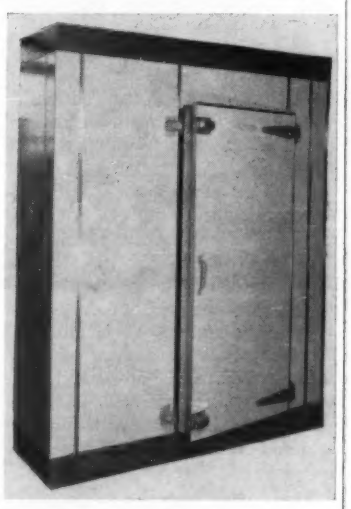


Remote Condensers For Air Conditioning

● Supplementing the company's existing line of "C" and "CB" units, a new line of remote air-cooled condensers—the "LH" and the "LV" series—has been announced by A. H. Witt Co., Inc., Dept. AH&RN, 940 N. Sycamore Ave., Los Angeles 38.

Being of large capacity, the condensers are particularly well suited for air conditioning installations, the company said. The LH series has horizontal air discharge while the LV units have vertical discharge and feature "very low silhouette design."

Low air volume and large amount of surface makes all models quiet and highly efficient, according to Witt. Capacities range from 2½ to 60 tons based on 90° ambient temperature and 120° condensing temperature.



Walk-In Cooler Is Nylon Plastic Covered

● Newest addition to its custom-built walk-in refrigerator line—an "all plastic" unit offering sectional cooling room versatility—has been announced by Albert H. Bromann, Jr., Inc., Dept. AH&RN, Schiller Park, Ill.

This walk-in is made to be expandable in three dimensions, is acid resistant, available in a wide range of colors, has high impact strength, is scratch resistant and corrosion free plus being easily cleaned, according to the company.

"The interior and exterior are covered with nylon reinforced phenolic plastic," it was pointed out. "The insulation can consist of 4, 6, or 8-in. glass fiber or Dow Chemical Co. 'Styrofoam.' Insulation is sealed on the hot side with an aluminum vapor seal. Framework is of #1 fir. Stainless steel moulding covers all vertical joints with fiber glass bases at the top and bottom. Interior corners as well as interior ceiling and floor are gasketed with vinyl gasket.

"All sections are secured from the inside with cadmium-plated lag bolts and washers to cast iron pods. The walk-in door consists of plastic face with 4-in. Styrofoam insulation and stainless steel back. Hardware is chrome."

Unusual light weight is attained with the manufacturers method of fabrication, according to the announcement, and is said to be about 3 lbs. per sq. ft.

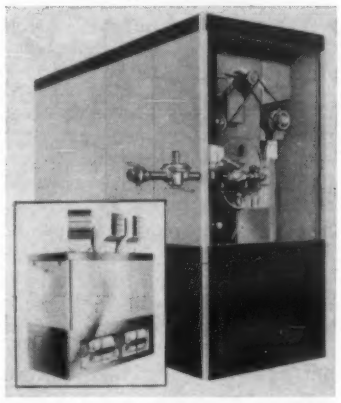
Industrial Heater Provides for Cooling

● A new dual-fuel OG4 series designed to be used as a central furnace, unit heater with directional discharge nozzles, or duct furnaces with performance capabilities for the future addition of industrial air conditioning is being offered by Lennox Industries, Inc., Dept. AH&RN, 200 S. 12th Ave., Marshalltown, Iowa.

The unit can be installed for upflow, down-flow, or horizontal delivery, and is U.L. listed, according to Lennox.

The heat exchanger of this new line has a cylindrical primary surface of 14 gauge No. 430 stainless steel and is anchored at the burner end to a 4 gauge front plate. Secondary heating surface is 16 gauge, 3½-in. diameter aluminized steel tubing connected to stainless and aluminized steel headers. A special construction feature is a provision for unrestrained expansion and contraction even at abnormal 180° temperature rise operation, the company said.

Either No. 2 fuel oil or gas are



burned in a single burner assembly with fuel selection determined by a manual selector switch furnished as standard or by an optional automatic selector.

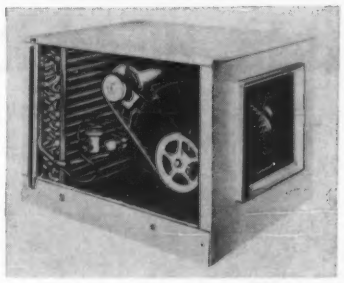
Belt-driven induced and forced draft blowers are mounted on one shaft with air-cooled bearings, powered by a ¾-hp. ball-bearing motor.

Split Systems Supply Auxiliary Cooling

● Split-system air conditioning systems currently being introduced by Crane Co., Dept. AH&RN, 836 South Michigan Ave., Chicago 5, are suited to homes and commercial installations where economical auxiliary cooling is desired, the company recently announced.

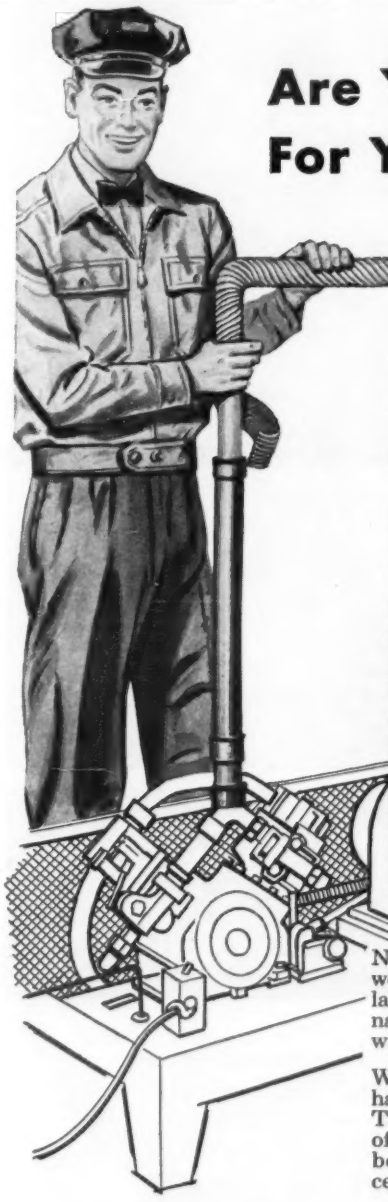
"The air-cooled Crane systems are adaptable to a wide range of installations, regardless of the type of heating system used," it was stated. "For warm air systems, a cooling coil is installed in the furnace plenum or ductwork, utilizing the existing blower for distribution of conditioned air. For homes and buildings using hydronic heating, an air handling unit with integral blower and motor is available."

Crane Co.'s model FB air handling unit is designed for use with ductwork as an independent air conditioning system in multi-space applications. An optional insulated plenum with four-way adjustable discharge grille is available for



conditioning a single space. Furnished with expansion valve, filter-drier, centrifugal blower, and disposable filter, the unit is available in 2, 3, and 5-ton sizes, according to the manufacturer.

More details on the products described on these pages may be obtained by writing the manufacturer at the address given in each story.



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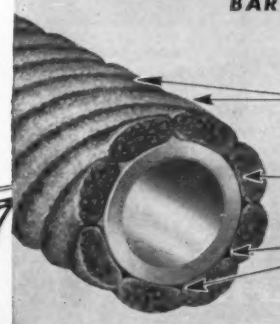

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Built-in moisture barrier assures utmost insulating efficiency.

3. INSIDE
Dead air is trapped between "corrugated strands", forms added insulation barrier.

NoDrip Tape means more profit, less work on every job . . . saves you time, labor, material. NoDrip Tape eliminates most multiple wrappings needed with thinner wraps . . . inferior wraps.

Why pay more when you can buy the handy 16 foot roll of ¼" thick NoDrip Tape at less than half the cost of a roll of ordinary ⅛" wrapping . . . and *far* below the cost of pre-formed foam cellular insulations?

Next time an equipment cold line job calls for *permanent* protection against condensation drip, "sweating" or frost, insist on using NoDrip Tape. Stops rust and corrosion, too . . . holds temperatures more constant and increases the efficiency of the cooling equipment.

NoDrip Tape is pliable, cork-filled and completely self-adhering. Easy to work with . . . forms an air-tight, 100% vapor and moisture proof jacket. Needs no tools, vapor seals, fasteners, brads or adhesives.

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Air Conditioning of Supermarkets Can Help, Hinder Refrigerated Fixtures

By Frank J. Versagi

VANCOUVER, B. C., Can.—Generally, air conditioning of supermarkets has been a blessing, both from the viewpoint of the customer and of commercial refrigeration manufacturers. Unfortunately, a poorly designed air conditioning system creates conditions which adversely affect the performance of refrigerated display cases.

This opinion was shared by three speakers at the commercial refrigeration symposium held during the 67th annual meeting of the American Society of Heating, Refrigerating & Air-Conditioning Engineers. Julius H. Rainwater, director of engineering at The Warren Co., Inc., Atlanta, chaired the symposium and stressed the need for practical coordination between air conditioning engineers and commercial refrigeration manufacturers.

"Although it is obvious that ambient conditions have a major effect on the refrigeration requirements of open display refrigerators, very little has been published on the various effects of temperature and humidity on these requirements," stated D. E. Friedman, chief engineer, Hussmann Refrigerator Co. "Conversely, there is little data on the effect which refrigerated equipment has on the food store air conditioning load."

Friedman described some test room data obtained using a standard 12-ft. open frozen food display case. He stressed that the data cannot be extrapolated to apply to other types of cases.

Three test points were selected in order to obtain data under ambient conditions of constant moisture, variable temperature and of constant temperature variable moisture. Table 1 lists the data obtained.

After defining the calculations used to obtain the "refrigeration expended in converting the moisture in the infiltration air to frost," Friedman offered Table 2 which shows net refrigeration after deduction of the latent heat load from total refrigeration and further reduction of heat load due to case accessories.

"At test point 3, which is closest to air conditioned store conditions, the sensible heat is over 90% of the total heat load. After taking the heat from electrical accessories into account, the net refrigeration effect of the display case on air conditioning is vastly reduced," stated the Hussmann engineer.

"It seems reasonable to conclude:

"1. For purposes of calculating the effect of the display case on the store air conditioning, the effect of this frozen food case should be considered as sensible heat effect only;

"2. The net effect of this 12-ft. frozen food fixture is less than 156 B.t.u.h. per lineal foot of case. This is such a small amount that it generally can be omitted from most food store air conditioning calculations."

This latter conclusion does not necessarily apply to applications of large vertical shelf merchandisers, according to T. L. Tyler, product development engineer, Tyler Refrigeration Corp. "It is very easy to overcool aisles in which such fixtures are mounted," Tyler offered.

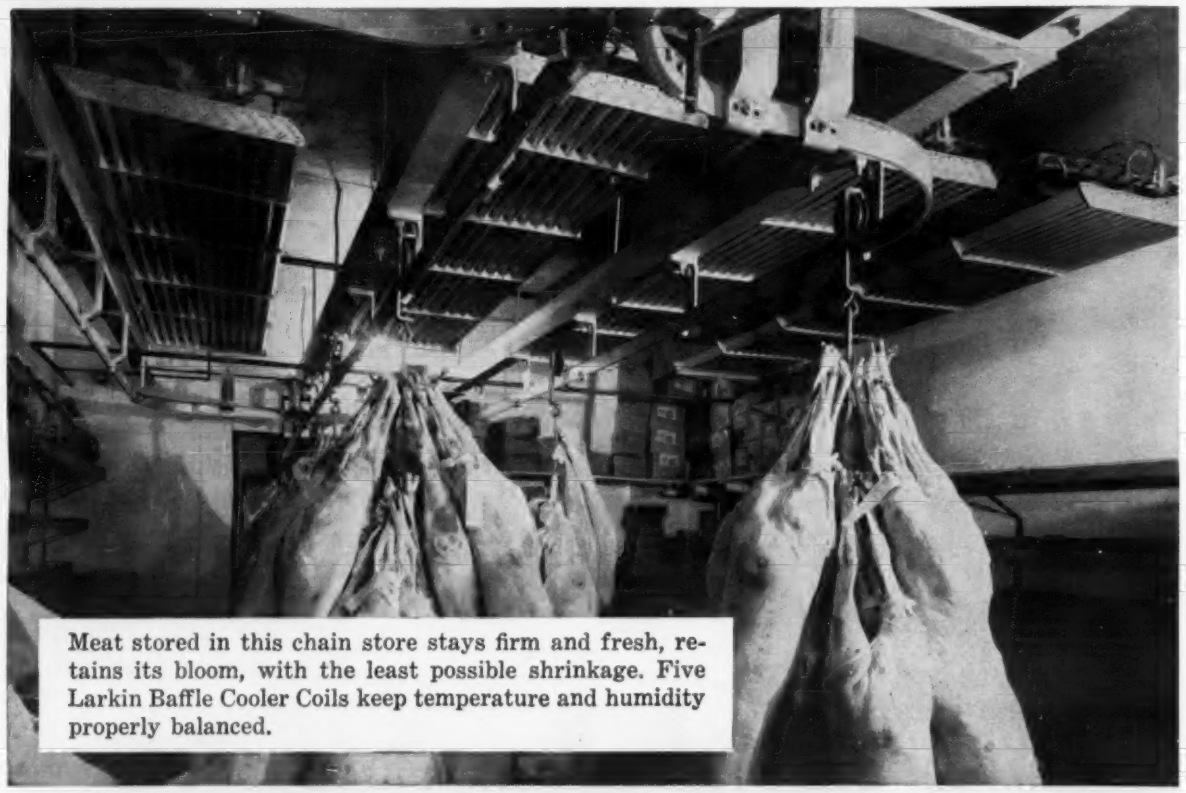
He agreed with Friedman that whenever the air conditioning load calculation includes the refrigeration effect of fix-

Table 1—Hussmann Test Data on Frozen Food Case

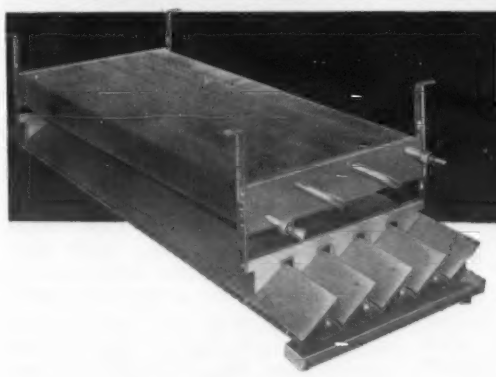
TEST POINTS	NO. 1	NO. 2	NO. 3
Room temperature	93°F	79½°F	78°F
Room relative humidity	58%	90%	55%
Display case return air temperature (avg.)	- 2½°	-2° (avg)	-5½° (avg)
Display case discharge air temperature (avg.)	-11½°	-9° (avg)	-12° (avg)
Duration of test	14 h., 43 m.	17 h.	16 h., 30 m.
Running time of refrigeration unit	14 h., 43 m.	15 h., 44 m.	13 h., 55 m.
Average suction pressure (R-22)	5½ psig	5 psig	5 psig
Average condensing pressure	182 psig	186 psig	184 psig
Weight of evaporator frost	6lb., 10½oz.	7lb., 3oz.	4lb., 3oz.
Refrigerating machine capacity	4500 Btuh	4320 Btuh	4320 Btuh

Table 2—Sensible Heat Load on Evaporator

	— TEST POINT —		
	No. 1	No. 2	No. 3
Refrigeration unit capacity — Btu/hr.	4500	4320	4320
Running time of refrigeration unit — %	100	92.5	87
Actual total Refrigeration — Btu/hr.	4500	4000	3760
Latent heat load — Btu/hr.	580	540	340
Sensible heat load — Btu/hr.	3920	3460	3420
Ratio sensible heat to total heat	.87	.865	.191
Heat load from case fans and heaters Btu/hr.	1810	1810	1810
Net refrigeration — Btu/hr.	2690	2190	1950



Meat stored in this chain store stays firm and fresh, retains its bloom, with the least possible shrinkage. Five Larkin Baffle Cooler Coils keep temperature and humidity properly balanced.



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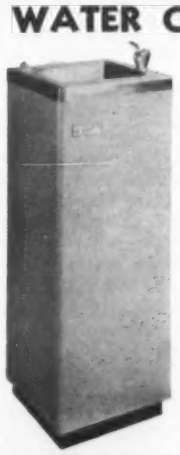

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tures, the fixture effect must be considered essentially sensible. "Refrigerated cases do not remove much humidity; the air conditioning design must consider moisture removal from store ambient."

Inter-Effect Between Store Cooling and Refrigerated Cases

On the subject of the inter-effect between store cooling and refrigerated fixtures, Tyler explained that the refrigeration load on an open display case comes from wall loss, product loss, and ambient air load. The first two items, he felt, are rather negligible under optimum conditions, but the ambient air load can have significant effects on case operation.

"The effect of ambient is manifested in three ways: 1) air load change, 2) vapor diffusion, 3) radiant heat load.

"Air change in open cases is caused chiefly by aspiration. Due to thermal currents and drafts, some air will be rejected from the case and replaced with store air. Greatest control possibilities are with the control and prevention of drafts."

Tyler cited data which showed that as much as 25% of the load on a refrigerated fixture can be due to air change in drafty locations; in good locations, heat load due to air change is on the order of 5%.

Radiant Heat 'Tossed Directly Into Product' Cited as Major Factor

Radiant heat, "tossed directly into the product," was cited as a major factor in case performance by the development engineer. "Case air cannot buffer out radiant heat," he said, and cited the example of meat packaged in transparent wrapping and in aluminum foil. The transparently wrapped meat will always be several degrees warmer than the foil wrapped product, stated Tyler. "This makes an adequately ventilated and cooled ceiling a very important factor in case performance. Such precautions with the roof can cut the radiant effect in half."

While Tyler felt that test rooms cannot duplicate practical conditions always, "there is evidence that two fifths of the load on a case is from radiation, another two fifths from diffusion and air change, and one fifth is due to the product."

He cited the figure of 50 f.p.m. for maximum air velocity near a case. Careful planning of the air distribution system can result in velocities of less than 25 f.p.m., he concluded.

Friedman's data on the effect of store ambient on refrigerated cases, based on tests with the frozen food fixture indicated that properly designed cooling can provide a major reduction in refrigeration load.

"A reduction in store temperature from 85° to 75° brings about an 8½% reduction in refrigeration load; a reduction in store humidity from 65% Relative Humidity to 45% RH in a 75° store will reduce refrigeration load by 16%." Hussmann intends to continue similar tests on equipment other than frozen food fixtures, Friedman stated.

Problems of Unfavorable Ambient Conditions

Showing a series of slides depicting frost formation and sweating of refrigerated cases due to undesirable ambient conditions, J. A. Biggers, director of engineering of Friedrich Refrigerators, Inc., recalled store humidities so high that labels came off cans and floor coverings floated off. Biggers cited a survey of Texas supermarkets which showed the majority, with air conditioning, were holding humidity too high, the average r.h. being 68%.

Oversized Conditioning Aggravates Problem

"Oversized air conditioning aggravates any humidity problem," he emphasized. He suggested the use of reheat, the use of the 24-hour method of load calculation, and the undersizing of units as factors which can be applied to reduce excessive humidity conditions. Condensation on cases also can be prevented by the use of heating elements at problem areas and the use of low thermal conductivity materials, such as plastics, Biggers concluded.

Florist Uses Refrigerated Cases, Cool Trucks

DALLAS—A feature of the new quarters of Marty Swartz Flower Selections at 1961 N. Haskell is one of the largest refrigerated display cases in the southwest, according to owners Jen and Martin Swartz.

An antique piano and a breakfront with brass-meshed doors have been modified to serve as display units.

In addition, the firm offers delivery via air conditioned panel trucks and station wagons. The new floral shop contains 4,200 sq. ft.

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Mechanical Specifications

Recommendations on What To Put In, Leave Out

KNOXVILLE, Tenn. — Considerable interest reportedly has been aroused, both locally and nationally, in recommendations for the development of mechanical specifications as prepared by the Associated Master Plumbing, Heating & Piping Contractors of Knoxville, Inc. and presented to the Knoxville Chapter of the Construction Specifications Institute.

Several meetings have been held regarding these recommendations "and the groundwork has been laid to incorporate a good many of the points in future specifications," according to Paul E. Howard, president of the contractor group.

The recommendations follow:

RECOMMENDATIONS FOR DEVELOPMENT OF MECHANICAL SPECIFICATIONS

I. **General Conditions** — There are some general conditions to specifications which contain modifications or features which the mechanical contractor feels unnecessary or objectional. We realize these objections do not apply to all specifications and in numerous cases probably none apply but are being called to attention so the specification writers may know which are basically objectional. These items are:—

a. Taking separate bids or letting separate contracts on some branches of mechanical work.

b. An unreasonable number or type of alternatives. If alternates are absolutely necessary, the number should be limited and the type to those which are thoroughly detailed and/or specified in mechanical division of work and can be readily calculated.

c. Insufficient time to prepare bids. If sufficient time is given, better prices are obtained and thus the owner benefits.

d. Compelling mechanical contractor to assume responsibility for discrepancies between various sections of specifications, or between various plans, or with existing local laws and ordinances.

e. Compelling mechanical contractor to assume responsibility for remodeling or alterations, unless existing mechanical conditions are adequately shown and specified.

f. Specifying unusual methods of work "by direction of manufacturer" in lieu of proper details and specifications. Where such work is specified to be guaranteed, the specifications should state that a guarantee bond will be required from and paid for by the manufacturer.

g. Bids should be received during the afternoon and should not be called for on Mondays or days following holidays. Bids should be opened and read in the presence of bidders.

h. No addendum should be issued later than 72 hours prior to bidding time.

i. Values of unit prices should not be given in the specifications. If unit prices are necessary in bidding, they should be kept to a minimum in number.

j. Special attention should be called to the AIA general conditions applying to payments and all parties should comply (articles 24, 25, 26, 37).

k. Retainage should be stipulated and should not exceed 10%. On large contracts—it is preferable that after contract is 50% complete there would not be any retainage on subsequent work if the owner determines that the contractors performance and progress have been satisfactory.

l. When the owner carries fire insurance on the structure, extended coverage, vandalism and malicious mischief should be included and the mechanical subcontractor should be named as additional insured, as his interest may appear.

m. Where work involves remodeling or addition to existing structure owner should provide waiver or subrogation in respect to insurance on existing structure or name mechanical subcontractor as additional insured.

n. A definite procedure for evaluating monthly progress estimate should be agreed on before the construction actually starts. Each item of mechanical work should be separated as to value of materials and installation prior to work being done, then compiling monthly progress estimates will become a pleasure rather than a burden, causing disagreement as to the value of material stored and in place and the value of work actually installed.

o. In view of the fact that a large percentage of commercial and industrial construction is performed by union craftsmen care should be exercised by the specification writer to specify under the proper section, items of work the respective crafts claim jurisdiction over. This will eliminate jurisdictional strikes on construction projects.

II. **Mechanical Work** —

a. Specifications and drawings should be clear, accurate, and precise. The specification should clearly state the kind and type of material and equipment required. All equipment fixtures, ductwork, and piping should be clearly shown on plan and section views and detailed on the drawings. All pipe sizes should be shown on plan and section views and also schematic layouts. On riser diagrams, the floor elevations should be shown.

b. A good mechanical layout on drawings is better than a 100-page text describing how the piping and ductwork is to be installed. The most accurate and competitive bids are possible when the mechanical contractor has a good and complete set of drawings and specifications to work from.

c. Some drawings are issued by the architect with the ductwork, heating, and plumbing piping on the same sheet and are almost unreadable due to the jumbled mass of lines. We recommend separate sheets of drawings for each of the following: Plumbing—heating and piping—air conditioning and ventilating. On large jobs it is suggested that separate sheets be provided for the plumbing waste and vent piping on one sheet and hot and cold water piping on another sheet.

d. Care should be exercised by the architect to make sure the mechanical drawings and specifications comply with all codes and laws governing same. The engineer should familiarize himself with the code governing the installation and design the system accordingly before requesting bids. It should not be the mechanical contractor's responsibility to change the design to meet applicable codes without receiving compensation for the additional cost, if any is involved. A large percentage of the plumbing designs furnished by the architects to the contractors for bidding purposes do not meet the local plumbing codes and the mechanical contractor is expected to make the necessary changes without compensation.

e. All painting required for the mechanical work shall be done by the painting contractor with the exception of base coat provided by equipment manufacturer. Color

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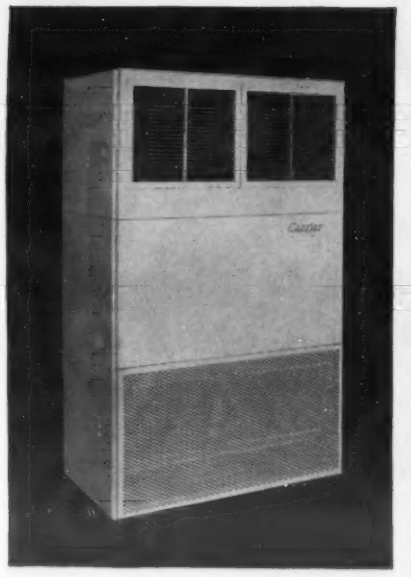

38R Fan and Coil Weathermakers

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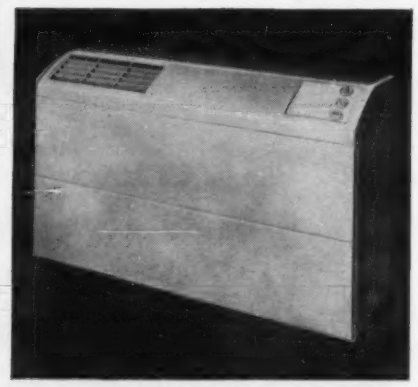

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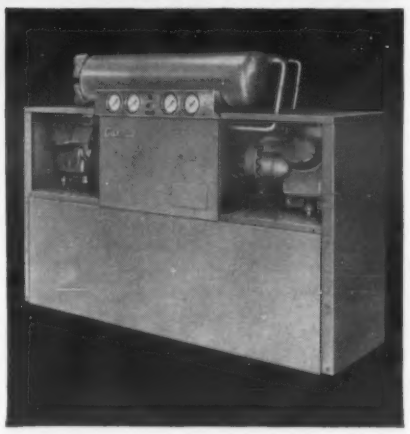
For new and existing buildings, these versatile units provide the benefits of a central air conditioning system at a fraction of the cost. An across-the-sill model is available, which ties in with central system heating through existing steam or hot water lines —or uses built-in electric resistance heat—to provide efficient and economical year-round heating and cooling. Neither unit requires remodeling or ductwork.



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coding specified shall be furnished by the mechanical contractor to the painting contractor for his installation.

Wiring Assignment

f. All electric power wiring shall be done by the electrical contractor. Motor controls and starters shall be furnished by the mechanical contractor to the electrical contractor for his installation. All controls and control wiring shall be furnished and installed by the mechanical contractor.

g. All concrete and masonry work for equipment base, manholes, catch basins, meter pits, valve pits, septic tank (except precast), and bases for drain tile shall be done by others under the respective sections of specifications governing the various items of work.

h. Foundation drain tile shall be installed by the plumbing contractor. Excavation specifications shall provide sufficient clearance to lay drain tile.

i. Metal access panels shall be furnished under the mechanical specifications. Cast iron and steel panels or removable openings shall be furnished under the miscellaneous iron section of the specifications. Wood access panels shall be furnished under carpentry.

j. Rock excavation and special hazards usually referred to in the excavating and grading sections, should also apply to the mechanical sections of the specifications.

k. All roof drains and roof flashing required for the mechanical work shall be furnished by the mechanical contractor to the roofing contractor for the roofing contractor's installation. Weight and type of material required for flashing material should be clearly spelled out in the specifications.

l. All shower pans other than membrane type shall be furnished and installed by the mechanical contractor.

m. The specifications and drawing should clearly state and show whose responsibility the installation of water and gas meters are. The drawings and specifications are generally not clear on this item.

Equipment Location

n. All equipment furnished by other but roughed-in by the mechanical contractor should be clearly shown and located on the mechanical drawings, such as laboratory and kitchen equipment. The specifications should be clear as to whose responsibility it is to rough-in, set, make final connections to equipment. If the mechanical contractor is to furnish part or all of the trim and accessories, then items should be listed and clearly specified.

o. Compressed air, gas, vacuum, oxygen, acetylene, lube oil, gasoline, and all pressure piping should be specified under the mechanical section.

p. When open sight or floor drains are shown and/or specified for air conditioning equipment, this should be shown and specified under plumbing. The drain lines from the equipment to the open drain should be shown and/or specified under air conditioning.

q. It is suggested that walls, partitions, chases, pipe tunnels, etc., be designed large enough to accommodate fixture supports, piping, and insulation.

r. Stand pipe systems for fire protection, including fire hose racks and cabinets and related apparatus shall be included under mechanical specifications except when included with sprinkler systems.

s. When air conditioning or heating equipment requires domestic water connections, these water lines shall be specified under plumbing, terminating with a valve opening at the equipment with final connections being made by the contractor who installs the equipment.

t. Rims for counter top sinks should be specified with the sink, to be furnished by the mechanical contractor for installation by the contractor who furnishes cabinets and counter tops.

Saving on Insulation

u. Sewing of pipe covering is no longer recommended due to prohibitive cost. Sewing will double or triple the cost of insulation work. Laggin adhesives are preferable where quality is desired.

v. When naming type of insulation, it is also necessary to specify actual thickness of insulation desired. There is no such thickness as "standard thickness." All manufactured molded pipe insulation are now designated as ½ in., ¾ in., 1 in., 1½ in. thick, etc. The desired pipe covering finish should also be specified, such as factory weight muslin, 8 oz. canvas, vapor barrier jacket, roofing jacket, etc. Type and color of bands should be at the option of the insulation subcontractor, since each manufacturer supplies different color and type bands.

w. Specifically name and itemize clearly what piping or duct is to be insulated. If piping or duct in certain areas of building does not require insulation, then so name such areas. If insulation is different for exposed and concealed piping and duct, then define clearly which is which. When referring to steam pipe insulation, it is clearer to say "insulate all steam supply piping" and to then state if condensate return is (or is not) to be insulated.

x. When hot water pipe buried in the ground is to be insulated, it should be clearly pointed out in the specifications and on the drawings. Such piping requires a special type of insulation material that is not affected by moisture in the ground to do an adequate job.

y. Where special underground insulation systems are required for underground steam distribution system, such special insulation system should be specified under a separate paragraph of the mechanical specifications and not under the general insulation paragraph. Some insulation subcontractors are not licensed or franchised to install such systems.

Insulating Ductwork

z. On air conditioning ductwork, it is better to name the various duct systems to be insulated. For example, the specifications may read, "insulate all supply air ducts in non-conditioned areas with ..... inches of ..... insulation. Do not insulate return air or fresh air ducts. Duct insulation should be specified by type (board type of flexible type), thickness (1 in., 1½ in., 2 in.), density (¾ sq. cu. ft., 6 sq. cu. ft.), vapor barrier facing (type and kind)." Whenever a vapor barrier is specified, it should always be only on the warm side of the insulation.

aa. Various items of equipment to be insulated should be named, such as boilers, converters, hot water heaters, storage tanks, breechings, chillers, pump, etc., type materials, application methods and finishes should be completely described. If a boiler or chiller is factory insulated, it should be so stated in the insulation paragraph.

bb. The control system required and desired should be clearly detailed on the drawings. The specifications should itemize the controls required and should give the sequence of operation expected. All electrical work required under the mechanical sections of the specifications should be in the control paragraphs. Where possible optional pneumatic and/or electric controls system should be specified. The controls for air conditioning and heating systems are a limited field and more and better competitive prices can be obtained if the systems are not too limited in the specifications.

cc. The specifications should clearly state what, if any, controls are factory assembled on equipment. There seems to be considerable confusion in the trade over this item.

...REVERE

DRYSEAL

COPPER REFRIGERATION TUBE

It's a dead cinch to bend dead-soft DRYSEAL. Your hands are all you need, even for the most intricate bends. And its ductility and special temper make it extremely easy to flare for compression fittings without danger of splitting.

And to make sure you get a tube that is free of even the slightest trace of dirt or moisture we double crimp DRYSEAL on both ends, at the factory. This is the final step in manufacturing, that immediately follows a special cleaning and dehydrating operation, which keeps dirt and moisture from entering the tube. That's why the inside of DRYSEAL shines like a new penny. This double crimping does not interfere with installation for it is made in such a way that the diameter of the tube does not change, permitting DRYSEAL to be passed through any opening large enough for the tube itself. Economical tube sizes range from ⅛" to ¼" O.D.

Also you'll find the job-size, 50-foot one-coil pack easy to handle, light weight, economical and sturdily made to assure protection of the tube.

COPPER ★ BRASS 18 01 ★ REVERE ★ ALUMINUM

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COPPER AND BRASS INCORPORATED

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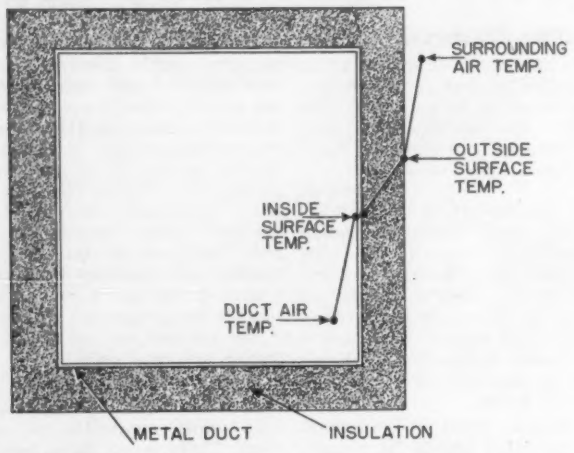
Mills: Rome, N. Y.; Baltimore, Md.; Chicago, Clinton and Joliet, Ill.; Detroit, Mich.; Los Angeles and Riverside, Calif.; New Bedford, Mass.; Brooklyn, N. Y.; Newport, Ark.; Ft. Calhoun, Neb. Sales Offices in Principal Cities, Distributors Everywhere.

Heat Flow Through Duct Sides Can Be Major Factor In Performance of Air Conditioning



TEMPERATURE distribution through an insulated duct wall at equilibrium conditions.

BOSTON—Heat flow through duct sides can be an important item in the over-all air conditioning system performance, asserts Carl O. Wood, manager of the engineering laboratory at Sturtevant Div., Westinghouse Electric Corp.

"In addition to increasing the system heat load unduly," he said, "a poorly designed system can radically affect comfort in surrounding spaces and also increase maintenance problems due to condensation."

He explained that heat losses or gains in ductwork follow normal heat transfer criteria where the air is moving in turbulent fashion on one side and is reasonably still on the other.

The heat loss or gain in uninsulated metal duct is usually about 2 B.t.u.h. per square foot per °F. while that in a duct insulated with 1 in. of insulation will be about 0.3 B.t.u./sq. ft./°F.

However, he said, these values can vary widely and the designer should calculate actual losses based on the particular construction used.

Data on heat transfer coefficients can be found in the ASHRAE Guide or other heat transfer references.

Moisture condensation on duct and plenum surfaces is an important problem in air conditioning and refrigeration, he added. Moisture will condense on any surface which is below the dewpoint temperature of the adjacent air.

The problem of preventing condensation, however, is not only that of maintaining satisfactory surface temperature, but also includes the proper sealing of the surfaces to prevent moisture migration through the materials to the cold inner surface of the duct or plenum.

The vapor seal is always placed on the warmer side.

The insulation covering must be applied with care so as to cover all cracks and holes on the outer or warmer surface.

Any through metal parts such as bolts or flanges which extend close to the warmer surfaces will lower the temperature locally and may be a source of condensation trouble.

The extent of condensation prevention measures will depend on the severity of the application. The temperature difference between the duct air and the surroundings and the relative humidity of the surrounding air are the critical factors.

Ways To Reduce Condensation Problem

There are a number of preventive measures which can be used to reduce the condensation problem, Wood said. These are:

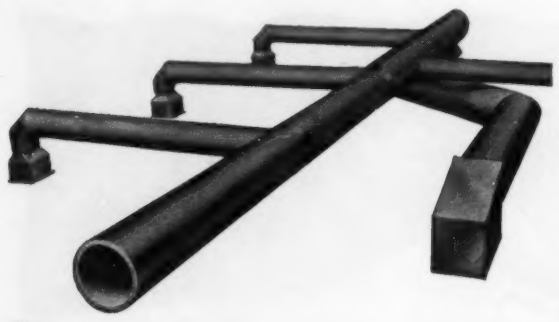
1. Provide ventilation either by natural means or by forced convection so that the moisture laden air in the surroundings is replaced with drier air.

2. Air condition the surrounding space. This may well pay for itself in savings on insulation and in improved working conditions in spaces such as equipment rooms.

3. Reduce the source of moisture by placing a vapor barrier such as asphalt paper or aluminum foil between the source and the duct. An example of this is crawl space where the damp ground can be covered to reduce the moisture evaporation.

4. Provide a porous surface on the cold side of the duct or plenum so that any moisture which passes the external vapor barrier will continue through and be carried away. Thus the moisture does not concentrate in the insulation.

5. Heat the surrounding space. This has the effect of raising the duct surface temperature above the dewpoint temperature. This corrective action has the disadvantage of increasing the heat flow into the duct or plenum.



for
QUALITY PLUS
ECONOMY
"there's nothing like
G-B DUCT!"

Cost-conscious contractors switch to "prefab" glass fiber duct; comfort-conscious customers are impressed

For maximum performance plus low installed cost, nothing does it like G-B DUCT — the round, prefabricated glass fiber duct for heating and air conditioning. Ideally suited for both residential and commercial use, this unique new duct is fast replacing conventional metal duct on many jobs across the nation. And for good reasons, too, for only G-B DUCT offers *all* the advantages of a lined metal duct plus the important *money saving extras* of a prefabricated duct.

HIGH IN QUALITY & PERFORMANCE

Because G-B DUCT is made 100% of glass fiber insulation, maximum thermal protection and sound absorption are "built-in" features. Every foot of this unique new duct is a self-contained sound trap. G-B DUCT carries an Underwriters' Laboratories label, and therefore meets all FHA requirements. As permanent as glass itself, this new duct will never rust, corrode, or deteriorate.

ECONOMICAL, FOOLPROOF INSTALLATION

Although somewhat higher in initial cost, G-B DUCT can be applied so simply and quickly that completed costs soon come in line with — *and usually undercut*—those for conventional metal ducts. The key lies in no preassembly work. There's no scoring, no folding. G-B DUCT comes in 6′ ready-to-use sections, in standard sizes up to 18″ in diameter. Sections fit snugly and swiftly together with standard metal sleeves and vapor barrier tape. Elbows and T fittings are also easily fabricated with a knife and factory-supplied templates.

ATTRACTIVE VAPOR BARRIER FINISH

G-B DUCT's uniformly thick walls are covered with an air-tight plastic vapor barrier sleeve, providing a smooth, attractive finish as well as positive protection against sweating and moisture build-up. With vapor barrier tape sealing all seams, a completed G-B DUCT system is neat and clean in appearance.

WINS ENTHUSIASTIC APPROVAL

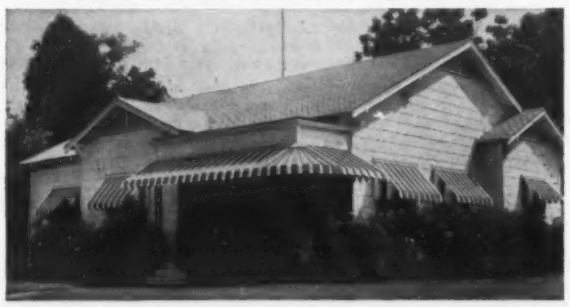
Every day more and more air conditioning and heating contractors are discovering the "quality plus economy" features of G-B DUCT. "Cut our installation time almost in half", reports the A/C Contractor of a 500-unit Florida housing project. "Pleased to report G-B DUCT is performing satisfactorily", says the contractor on an 800-unit housing project. "Comparative cost studies show G-B DUCT doubles our manpower output", adds another on a 300-home development.

Discover for yourself the many advantages of G-B DUCT. Write today for complete information, including simple installation instructions.

GUSTIN-BACON Mfg. Co. gb

218 W. 10th St., Kansas City, Mo.

Versatility of G-B Duct is illustrated by its recent use in an 800-unit new housing project (above) and in the remodeling of a 50-year-old home (below). It is also being used in commercial and institutional installations, large and small.



Anthony A. Pack General Manager Of Recony Div.

RICHMOND, Va. — Anthony A. Pack has been appointed vice president and general manager of the Recony Div. of Vinco Corp., it was announced by Andrew J. Asch, Jr., a director of Vinco and president of Recony.

Pack was formerly with the Hamilton-Standard Div. of United Aircraft Corp. at Hartford, Conn., in executive, administrative, and engineering capacities related to military ground support equipment.

Recony designs and manufactures environmental control equipment and military air conditioning and heating units at its plant facilities at Richmond, and is currently broadening its activities in the general field of aircraft and missile ground support equipment.

Democratic Convention Air Conditioning-

(Continued from Page 1, Col. 1)
Republican Party (starting July 25 at the International Amphitheater in Chicago).

The statements made in the first paragraph were probably particularly true of all the political conventions prior to the start of World War II. In fact, there are some historians of our political scene who believe that insufferable heat and humidity and lack of ventilation at certain conventions earlier in this century were a major factor in determining the candidate—in that the suffering delegates agreed to compromises they might normally would have rejected, merely to get relief from convention hall conditions.

Air conditioning now saves the convention delegate from any possibility of heat prostration, dehydration, and lack of oxygen, since the holding of conventions in other than an air conditioned hall would be unthinkable in these times. The delegates will carry on their deliberations in a cooled atmosphere that will not provide any excuse for them to lose their convictions because they are "wilting from the heat."

Thinking Man's Oxygen and Ion Bar

For some political VIP's at the convention, air conditioning will take on a new meaning. An ABC TV network spokesman has reported that a special "relaxation room" which will have negatively-ionized air and an oxygen bar will be provided as "a private resthaven for political figures waiting to go on the air." The network spokesman said that "negative ionization of the air stimulates a sense of exhilaration, and contributes to clearer thinking and a more positive attitude and behavior pattern."

Some Concern About Sports Arena's Air Conditioning

Some concern has been expressed about whether or not the air conditioning in the Los Angeles Sports Arena will be able to cope with the kind of conditions imposed on it by the convention. A reporter for the *Wall Street Journal* conjured up the following "possible" condition:

"The temperature hovers at 97° and smog shrouds the city. Inside the Sports Arena . . . the air conditioning system is handicapped by temporary walls put up to form caucus rooms, TV and radio studios, and press rooms. Adding to the system's troubles are hugh banks of lights for TV and newsreel cameramen. Slowly but surely the temperature creeps upward until, suddenly, the sprinkler system cascades water on delegates (and all others in attendance). Rushing for shelter, the crowd smashes into temporary walls, ripping them loose from the floor. . . ."

Arena Engineer Confident

But William Kimble, chief engineer for the Sports Arena, when interviewed by the NEWS said "I don't see how anything like that could possibly happen unless our air conditioning system quit functioning altogether, and the only way I can see that happening is through a power failure.

"If the temperature hits in the high 90's and there are 15,000 people in the Arena, we may not provide perfect conditions, but the people aren't going to wilt away. We think we have enough cooling capacity to handle the situation without auxiliary help, but we know that some of the TV and radio people will be providing separate air conditioning for their special facilities."

Ice Rink Equipment Is Ace-In-The-Hole

Kimble's ace-in-the-hole is his reserve capacity, which comes from equipment installed for ice making for use when the Arena has an ice skating event. Normal capacity of the water-chilling system used for air conditioning is 700 tons, provided by two Carrier machines.

However, refrigeration equipment for producing ice for the skating rink used for ice shows, consisting of two Worthington reciprocating compressors — a 150-ton belt-driven unit and a 200-ton direct-driven unit, both having across-the-line starters — are so designed so they can chill either brine for the ice floor, or chill water to provide 350 tons extra capacity for the air conditioning of the arena.

In the system designed by Welton Becket & Associates (architect and engineer) mechanical engineering department, and installed by Western Air & Refrigeration, Inc. of Los Angeles, the design was geared both to the variety of events, the construction of the arena (an elliptical dish without columns in the arena area with a one-story concourse), and to the various types of crowds.

The air distribution system was designed to serve the arena, concourse, and seating area independent of one another. For the permanent seating area there are eight central fan units located in an overhead furred soffit. Each unit is designed to deliver 50,000 c.f.m.

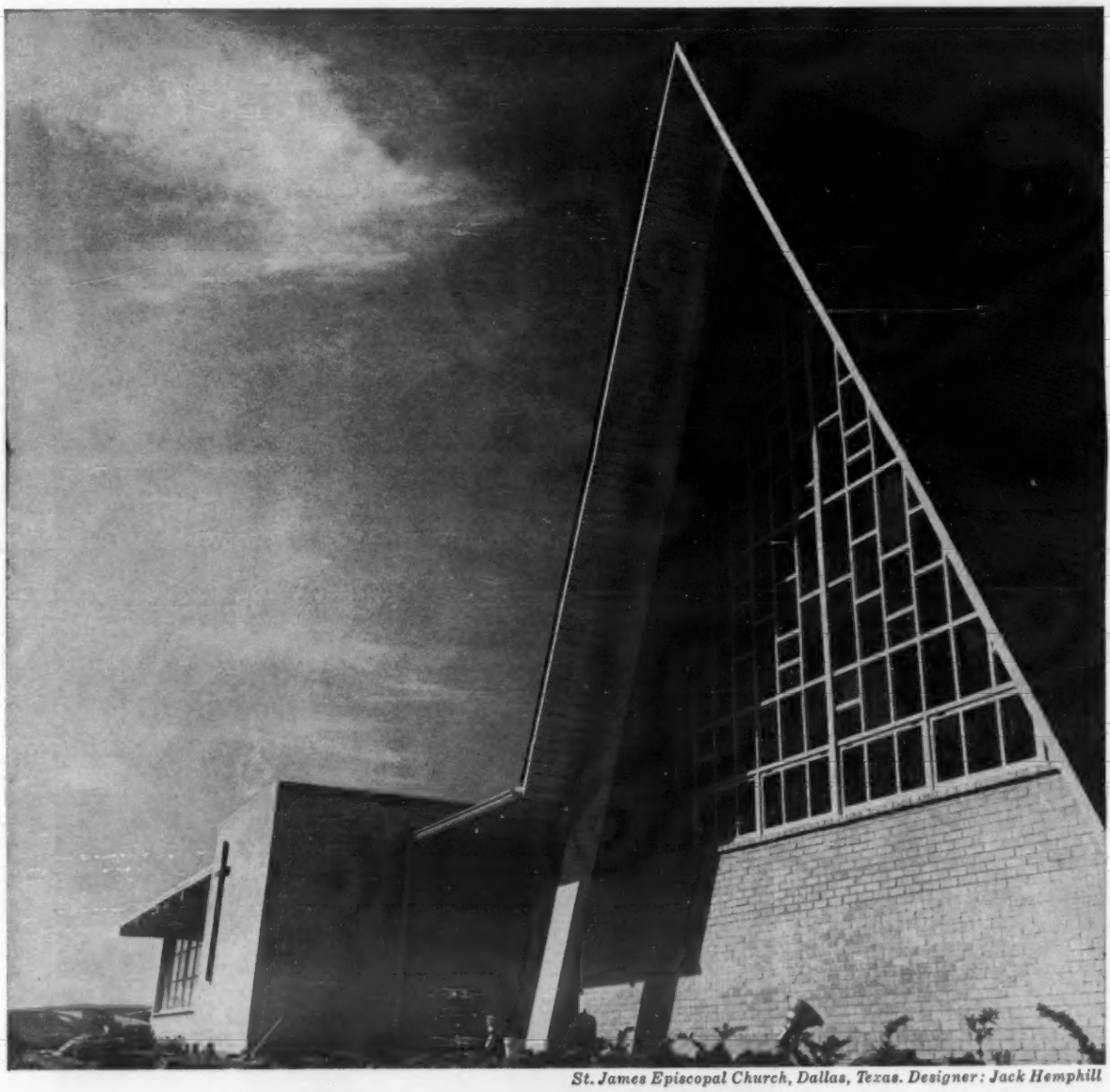
Individual units are equipped with outdoor and recirculation air dampers, combination return fans, exhaust fans, and dual temperature Recold heating and cooling coils. The piping system supplying these units is arranged as a two-pipe reverse water system, providing chilled or hot water as required.

The arena floor area is served by six Recold air handling units also located in the furred soffit. The concourse floor of the Sports Arena is treated as four zones with each zone having its own Recold air handling unit capable of supplying either cooled or heated air. Ventilation of the individual systems is normally controlled thermostatically, but a central station control allows a prompt correction if any area needs more or less tempering.

O'Brian Associates To Open New Building

MIAMI, Fla.—Grand opening of the new building being occupied by O'Brian Associates, air conditioning and refrigeration supplies wholesaler, at 2999 N.W. 2nd Ave. here, will be held on July 14, 15, from 9 a.m. to 6 p.m. each day.

Those in the trade are invited to bring their families to the opening festivities in the new, ultra-modern facilities.

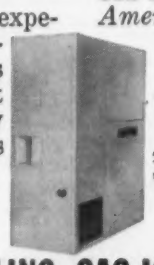


St. James Episcopal Church, Dallas, Texas. Designer: Jack Hemphill

Now we're cooling with GAS!

It's comfortably cool in this strikingly modern church—even with the Texas sun burning against its tall and beautiful glass wall. The system is the most modern, too—an Arkla-Servel gas air conditioning unit.
After careful study backed with successful experience in previous jobs, the architect specified gas and Arkla. "The main reason is performance. What could be easier. You just set it, and forget it. Of course, economy plays a big part, too . . . but basically it's the trouble-free operation."

You or your clients can have this same efficient year 'round operation. For specific information, call your local gas company, or write Arkla Air Conditioning Corporation, General Sales Office, 812 Main Street, Little Rock, Arkansas.
American Gas Association.



Gas-operated Arkla-Servel Air Conditioning Units
• lowest operating costs • fully automatic operation
• long dependable service • packaged construction
• compact size • easy installation

Three 5-ton Arkla-Servel Sun Valley Gas units heat in winter . . . cool in summer.

FOR HEATING & COOLING, GAS IS GOOD BUSINESS!

TECH CENTER

by Frank J. Versagi, Technical Editor

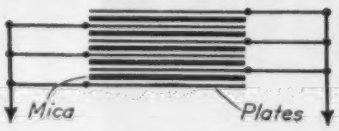
Capacitors

In the discussion of capacitance in the Tech Center series on APPLIED ELECTRICAL THEORY, it was pointed out that although some capacitance exists in almost any circuit, practically speaking capacitance is added to a circuit with a device called a **capacitor.** Anyone who has worked with motors has encountered capacitors; anyone who has worked in electronics or in automotive mechanics has handled capacitors, although in these latter fields, the devices are usually called condensers.

The misnomer **condenser** came about because electricity was originally conceived to be a fluid, and the phenomenon of storing charges was thought to be equivalent to condensing this electrical fluid. Some think that devices above a certain microfarad rating are capacitors, while devices with a lower rating are condensers. This is not the case. Although the term condenser is a misnomer, when used in this connection it is completely synonymous with capacitor.

Before discussing capacitors, it is well to recall that the action of capacitance in a circuit is to store a charge and to increase its charge if the voltage rises, or discharge if the voltage falls. As a resultant of this characteristic, capacitance tries to hold voltage down when the voltage is rising; it tries to hold voltage up when the voltage is decreasing.

Basically, a capacitor is a device consisting of two plates which can be charged, and which are separated by an insulating material called a **dielectric.**



Early capacitors were actually made of metal plates; modern capacitors are made of metal foil. Common dielectrics are air, mica, waxed paper, and oil. The foil/insulation combination may be rolled to give a great capacitance in a small volume, where compactness is necessary.

The effective capacitance of a capacitor is affected by three factors:

1. The area of the plates facing each other—the greater the area, the greater the capacitance;

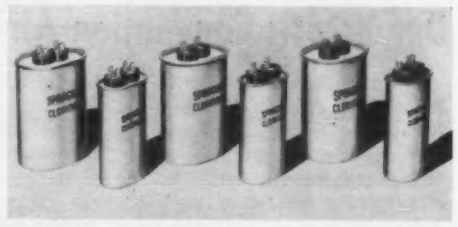
2. The distance between the plates—the closer together they are the greater the capacitance;

3. The nature of the dielectric—materials differ in their insulating qualities—also, the thinner the dielectric, the greater the capacitance.

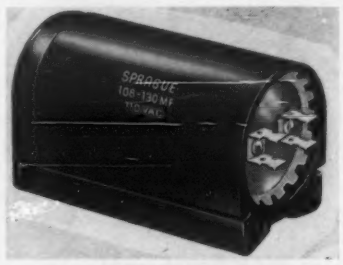
In practice, then, any one or all of these factors may be designed to obtain the range of capacitor ratings needed for specific applications. One significant result: **capacitors of exactly the same capacitance may have different voltage ratings due to the difference in the thickness of the dielectric.**

If the dielectric thickness is increased, the plates will be further apart. To make up for the reduction in capacitance caused by increasing the distance between plates, the plate areas are increased. So, capacitors of higher voltage ratings are larger in physical size, even though they have the same capacitance.

There are several types of capacitors: fixed mica capacitors, air capacitors, paper capacitors, oil-filled capacitors, ceramic capacitors, electrolytic capacitors. Capacitance ratings are either printed on the capacitor, or color bands are used which indicate capacitance according to an international code.



RIGHT: Running capacitors, oil-filled. BELOW: Start capacitors, electrolytic type.



Of major interest to the heating-cooling industry are two of these many types—the electrolytic and the oil-filled. The former is used only for starting duty on motors; the latter may be used for moderate starting loads, but is more often used as a running capacitor.

On motor duty, capacitors perform one or more of three functions: 1) starting; 2) limit running current to keep motor cool and to meet Underwriter's Laboratory specifications; 3) improve power factor to meet utility regulations.

One in a series of interviews with the men who are "Virginia"

"Equipment can be damaged easily by using a strong, corrosive scale remover—choose one that is well inhibited, yet still strong enough to clean effectively"

Vincent Klucz, field engineer for Virginia Smelting Company

Water treatment specialist Vincent Klucz, of Virginia Smelting Company, discusses problems in removing scale in air-conditioning systems.

Q How serious a problem is corrosion in scale removal?

A It can be very serious, especially when the metal surfaces are galvanized. Many of the currently available scale removers can chew off most of a galvanized coating in just a few hours. And with that protection gone, the bare metal will start corroding simply by being exposed to the circulating water.

Q Does "Virginia" offer a really safe scale remover?

A Yes. Our solid scale remover is one of the safest available. Basically it consists of sulfamic acid—about 96%—and this is very effective in removing most types of scale. Then there are special inhibitors that have been added to reduce sharply its corrosive effect on copper, iron, steel and aluminum but that do not affect the scale dissolving efficiency. Two pounds of our solid scale remover will remove one pound of scale. For a service company that is concerned with protecting as well as cleaning the customer's equipment, "Virginia" Solid Scale Remover is an ideal choice.

Q Is it easy to use?

A Easy—and safe for the operator as well as the equipment. It's a dry powder—so if you drop it, there's no broken glass, no acid splashing around, no danger of injury to anyone. Just shovel up the powder. Add it to the water and stir until the powder is dissolved. There are no noxious fumes that could endanger the operator, either.

Q Is there any way to avoid scale buildup?

A Yes. All water contains impurities in varying degree . . . either as suspended solids or as solids and gases in solution. The solids, of course, cause scale buildup, and the gases cause corrosion. "Virginia" Scale & Corrosion Inhibitor does an excellent job of keeping these impurities in suspension or solution, thus greatly retarding scale buildup in the system. It offers other advantages, too. As little as 2 to 4 parts per million in the water will take care of retarding scale and 25-50 parts per million will deposit a thin, protective film over all metal surfaces to exclude oxidation attack. And it has a neutralizing effect on weak acids formed by airborne gases. I might point out that the best time to use preventive treatment is immediately after cleaning a system. Just add the right amount of inhibitor to the sump water and check for proper bleed.

Full details on water treatment

Our folder "How to Turn Water into Money" gives all the facts on water treatment—preventive and remedial action. For a copy, write Refrigeration Division, VIRGINIA SMELTING COMPANY, 485 Jefferson St., West Norfolk, Va.

VIRGINIA® Chemicals

Water Treatment Chemicals • Esotoo • V-Meth-L • Can-O-Gas VascoCel • Presstite Tape • Permagum • Suniso Refrigeration Oils • National Sales Agent & Repacker for Du Pont's "Freon" Refrigerants.

Available in Canada and many other countries

The electrolytic capacitors, with microfarad ratings from 1 to 1,000, are formed from aluminum strips and chemical coatings which chemically produce the equivalent of two charged plates and a dielectric. While motor starting electrolytic capacitors can be used on alternating current, there are electrolytic capacitors designed only for direct current application which must be installed with correct polarity connections.

Applied to a capacitor start motor, the electrolytic capacitor helps create the out of phase relationship needed between the starting and running winding in order to produce sufficient starting torque. The stator consists of a main winding and a starting winding wired in parallel and placed at right angles to it. The necessary 90° electrical phase difference is accomplished in this way: upon starting, the start winding is in series with the capacitor. The capacitor is of such a value that, together with the resistance of the start winding, it causes the current to **lead** the voltage about 45°. The main winding has enough inductance to cause the current to **lag** the line voltage about 45°. The combination of the 45° **lead** in the start winding and the 45° **lag** in the run winding create the 90° phase shift which, in effect, creates a two-phase motor.

On the capacitor start, induction run motor, the capacitor is cut out of the circuit at about 3/4 speed. Indeed, the electrolytic capacitor is not designed for continuous duty and would fail if left in the circuit. A contributing factor is the large current which must pass through the capacitor during starting to supply adequate torque. Once the motor is up to speed, there is no longer need for the high current.

Two capacitors, one for starting, the other for running duty, are used on a capacitor-start, capacitor run motor. In this case, the second capacitor, an oil-paper one, is wired in parallel with the starting capacitor. When the motor reaches speed, and the high starting current is no longer needed, the starting capacitor is cut out, but the second capacitor and the auxiliary or start winding remain in the circuit, causing the motor to run as a two-phase motor. Two-phase motors are more efficient than single-phase motors.

The PSC, permanent split capacitor, motor makes use of a running-type capacitor which stays in the circuit during starting and winding. This type of motor is limited to those applications having moderate starting requirements.

There are several practical considerations which should be considered in the use of capacitors on heating-cooling motor applications.

1. A smaller microfarad rating than design calls for, results in less torque and places more electrical stress on the dielectric.
2. A larger mfd rating than design results in more torque but decreases the time the capacitor is connected to the motor winding. This can result in a stalled motor.
3. A capacitor with a lower than design voltage rating will not give adequate service and will fail if the voltage is too high.
4. A capacitor with a higher than design voltage rating will operate successfully and will probably last longer.
5. A capacitor with a lower than design mfd rating will void UL and utility approval in most cases, since the unit will not meet electric specifications.
6. A capacitor with a higher than design mfd rating will lower the running current and will increase the power factor, but it may adversely affect the running speed.

Capacitor manufacturers provide a multitude of sizes and ranges for all possible uses. Basically, there is only one correct capacitor for each motor. Since a capacitor's mfd rating can affect:

watts—in and out,
watts lost,
amp draw,
speed,
torque,
efficiency,
and power factor,

it seems unwise to tamper with the manufacturers' recommendations.

file guide: ELECTRICITY: capacitors

Next: SOME PRACTICAL POINTERS ON CAPACITORS

Great Plains RSES Elects Officers

ABERDEEN, S. D. — New officers of the Great Plains Chapter of the Refrigeration Service Engineers Society, elected at the meeting held recently here, include Wilbert Simmons, Conde, president; Carroll Hunstad, Aberdeen, vice president; Lyle Stanley, Aberdeen, secretary-treasurer; Howard Humann, Waubay, sergeant-at-arms; and Frank Gese, Aberdeen, retiring president, educational director.

Plant Vacation Schedule

Shutdowns Starting July 30 or Later

Company	Shutdown Period: Plant	Shutdown Period: Office	Shipments From Plant
Rudy Mfg. Co., Dowagiac, Mich...	7/30-8/14		None
Kenmore Machine Products, Inc., Lyons, N. Y.	8/6 -8/14	8/6 -8/14	None
Tecumseh Products Co., Tecumseh, Mich.	8/6 -8/21		Stock Only
Bohn Aluminum & Brass Corp., Danville Div., Danville, Ill.....	8/7 -8/21	8/7 -8/21	Stock Only
Dryomatic Corp., Alexandria, Va..	8/7 -8/21	8/7 -8/21	Emergency
Pines Engineering Co., Inc., Aurora, Ill.	8/7 -8/20		None
Airtemp Div., Chrysler Corp., Dayton	8/8 -8/21	8/8 -8/21	Emergency
General Electric Co., Tyler, Texas	8/8 -8/21	Open	Regular
Payne Co., La Puente, Calif.	8/8 -8/26	Open	Stock Only
Victor Products Corp., Hagerstown, Md.	8/8 -8/21	8/8 -8/21	Stock Only
Viking Copper Tube Co., Cleveland	8/8 -8/22	Open	Stock Only
Westinghouse Electric Corp., Air Conditioning Div., Staunton, Va.	8/8 -8/14	8/8 -8/14	Emergency
Westinghouse Electric Corp., Sturtevant Div., La Salle, Ill....	8/8 -8/21	8/8 -8/21	
Temprite Products Corp., Birmingham, Mich.	8/13-8/28		Stock Only
Copeland Refrigeration Corp., Sidney, Ohio	8/15-8/28	8/15-8/28	Emergency, Stock Only
Friedrich Refrigerators, Inc. San Antonio	8/15-8/28	Open	Regular thru 8/19
Gibson Refrigerator Co., Greenville, Mich.	8/15-8/28	Open	Regular
Bendix-Westinghouse Automotive Air Brake Co., Evansville Div., Evansville, Ind.	8/15-9/4	8/15-9/4	Emergency, Stock Only

"VIRGINIA"

Water Treatment Chemicals

Solid Scale Remover

A 96% sulfamic acid dry formulation specially inhibited to reduce attack on metal surfaces. Empty into the water and stir. It goes to work instantly. Non-injurious to galvanized, dipped zinc, and aluminum water-cooled equipment when used as directed. Easy to use—no heavy glass jugs—no hazards from breakage. Destroys algal growths, too.

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Heating, Cooling Salesmen Driving Further In 1960 To Make Sales

CHICAGO—Heating and air conditioning salesmen are driving further in 1960 to make their sales than they did in 1959, according to Wheels, Inc., auto fleet leasing firm.

Average mileage for heating and air conditioning salesmen driving autos on company business rose to 2,106 miles per month for the first four months of 1960, compared to a monthly average of 1,988 miles for the same period of 1959, it was reported. This covers business mileage only.

A. J. Schoen, president of Wheels, revealed the results of a national survey covering all industries.

The 12-month average for heating and air conditioning salesmen for 1959 was 22,500 miles, Schoen said. Projected average for 1960 is approximately 24,000 miles, he added. Annual averages reflect the much lower mileages traveled for business in summer months as a result of vacations and the sharp drop in driving by salesmen around Christmas.

"Salesmen report that their customers are tougher on price, are making increased demands for speedier deliveries, and are more exacting as to the quality of the merchandise they order."

1959-60 Mileage Chart

	1959	1960
January	1,997	2,124
February	1,835	1,973
March	1,998	2,119
April	2,029	2,208

How To Select Single Belt-Driven Blower, Determine Motor Speed for Add-On Cooling

By Harold F. Farquhar, Chief Engineer, The Lau Blower Co.

The continuing trend of central home air conditioning is focusing more and more attention to the add-on type unit.

In most cases the blower requirements for heating are not the same as the requirements for cooling, although in northern parts of the United States, they may be the same.

These air requirement factors are not entirely controlled by the equipment manufacturer. They are primarily influenced by the architecture and construction of the home, duct system design, register location, home orientation, amount of shading, geographical location, and such hard-to-measure factors as the living habits of the family.

This situation indicates the desirability of a heating blower adjusted to operate at the proper speed during the winter and a separate cooling blower operating at the proper speed for cooling. Many year-round systems have been installed with a single blower operating at a speed providing a compromise air delivery.

In most sections of the country, this arrangement is not ideal but it is considered satisfactory in many cases. Selection of the blower motor and required speed, is often by trial-and-error. This hit-or-miss method can be eliminated by using blower r.p.m. as the basis for establishing initial operating conditions. The following examples are for belt-driven blowers. Direct-drive blowers present special problems which are not covered in this discussion.

First, the air flow rate in cubic feet per minute must be obtained. A reasonably accurate determination can be made if the B.t.u. per hour output and the air temperature rise through the furnace, are known.

The following equation may be used:

$$CFM = \frac{\text{B.t.u.h. output at bonnet}}{1.1 \times \text{temp. rise}}$$

It is not the purpose of this discussion to present methods of checking furnace input and efficiency. Suffice to say, burner input should be accurately checked and combustion efficiency should be measured by means of flue gas analysis.

Following are a few points which may be helpful in determining B.t.u.h. output and temperature rise:

(a) B.t.u.h. output = B.t.u.h. input × efficiency.

(b) Oil furnace efficiency can be greatly changed by minor air adjustments. The efficiency for a particular installation may be obtained from charts based on flue temperature and CO_2 content of the flue gas.

(c) No. 2 fuel oil contains approximately 140,000 B.t.u./gal.

(d) An outside oil tank will contain cold oil. The viscosity of oil varies with the oil temperature. The rating stamped on the nozzle is not necessarily the actual oil input rate. Nozzle variations, pressure variations, oil conditions, dirty screens, etc., can affect the rate of oil consumption.

(e) Gas input may be determined by timing one revolution of the 1 cu. ft. dial of the gas meter:

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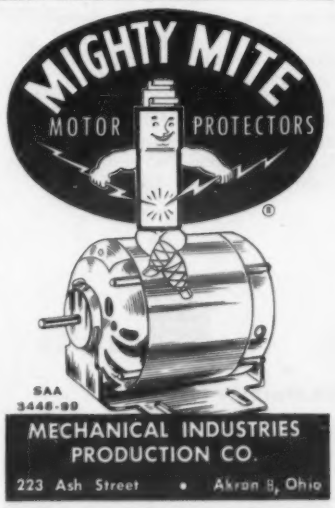

Thinking of—

- **changing territories**
- **expanding your territory**
- **taking on new lines—**

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Your opportunity may be there.

$$\text{B.t.u.h. input} = \frac{\text{B.t.u. content per cu. ft. of gas} \times 3{,}600}{\text{Seconds per revolution of 1 cu. ft. dial}}$$

(f) Gas designed furnaces should not exceed the input rating shown on the nameplate. The gas input may be reduced slightly (no more than 20%) to balance the furnace output to the maximum load imposed during severe weather.

(g) Temperature rise through the unit may be obtained by placing thermometers in the return air duct system near the furnace inlet and in the warm air plenum at the furnace outlet. The difference between the inlet and outlet readings is the temperature rise through the furnace. Place these thermometers so they are not influenced by direct radiation from the heat exchanger and take the readings after the furnace has operated long enough so there is no further substantial change in temperature.

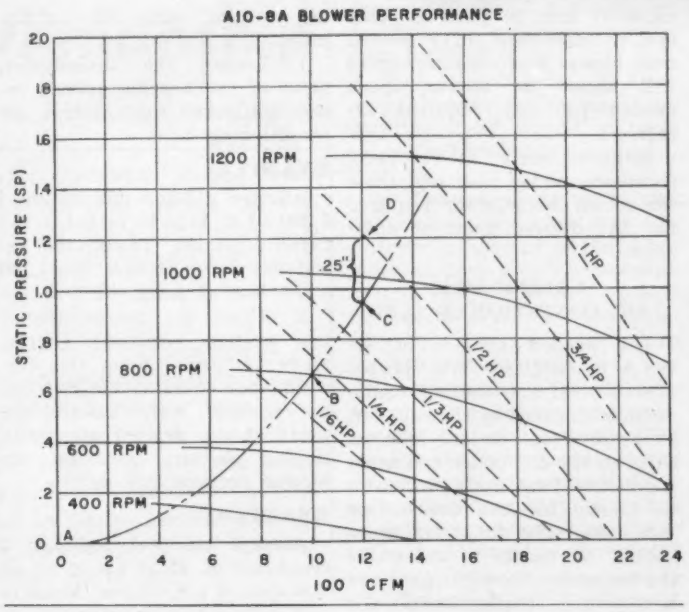
Readings should be taken with the blower access door in place and with all dampers and registers set for normal operation. There may be considerable difference in temperature between air at the top of a trunk duct and air at the bottom. Also, air temperatures may vary in different duct on the same furnace. The average outlet temperature should be used.

EXAMPLE:

Given: Gas furnace of 125,000 B.t.u.h. input
Furnace efficiency 80%
Return air temperature 70° F.
Average W.A. plenum temperature 161° F.

Find: Temperature rise and CFM

Temperature rise =



$$161° - 70° = 91°$$

B.t.u.h. output =
125,000 × .80 −
100,000 B.t.u.h.

$$\text{CFM} = \frac{100{,}000}{1.1 \times 91} =$$

1,000 c.f.m.

The second piece of information needed is the r.p.m. of the blower. Ideally, this should be measured with the blower access door in place, using a stroboscopic tachometer. Since this is not practical in actual installations, the following method may be used with sufficient accuracy for air conditioning purposes. This is for belt-driven blowers:

With the blower switch off, rotate the blower pulley one (1) complete turn. Count the number of revolutions which the motor pulley makes for one revolution of the blower pulley. Call this figure "Pulley Ratio."

The blower speed can then be determined as follows:

Divide the rated motor speed by the Pulley Ratio.

EXAMPLE:

Given: Rated motor speed — 1,725 r.p.m.
Pulley Ratio—2⅙ revolutions of motor pulley to one revolution of blower pulley.

Find: Blower speed.

$$\text{RPM} = \frac{1725}{2.16} = 800 \text{ r.p.m.}$$

This method of determining blower speed cannot be used with shaded pole or permanent split capacitor motors where the motor speed varies substantially with the load on the motor. For split phase or capacitor start motors which are operating near full load conditions with proper belt tension, this method of determining blower speed will be accurate enough for motor and drive selection.

The third step is to locate the actual point of furnace operation on the blower performance curves for the specific blower in the furnace.

EXAMPLE:

Given: Furnace c.f.m. — 1,000 c.f.m.
Blower r.p.m. = 800 r.p.m.
Blower size—A10 — 8A

Find: Point of operation.

Read vertically along 1,000 c.f.m. to intersection of 800 r.p.m. line at Point B. This indicates that the blower is operating against a complete system resistance of .66 in. s.p. This static pressure condition includes not only the resistance of the ducts, registers, and grilles, but also the internal resistance of the furnace, including filters, impact losses, sudden expansion losses, etc.

SYSTEM RESISTANCE

Experimentally it has been shown the friction loss in a system increases approximately as the square of the c.f.m. When this system friction or static pressure is plotted on a blower performance chart, the resultant line is a curve in the shape of a parabola passing through the point of zero static pressure and zero c.f.m. Mathematically this may be stated as follows:

$$\frac{SP_1}{SP_2} = \frac{(CFM_1)^2}{(CFM_2)^2}$$

(Continued on next page)

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Temp-O-Larm is being promoted by national trade advertising and publicity, and special dealer sales aids are available. Most important of all, Temp-O-Larm bears the name of Kidde – most respected name in the alarm business.

For more information on Temp-O-Larm, and how it can bring in profits for you, write to Kidde Ultrasonic & Detection Alarms, Inc.

Annunciator in store signals dangerous temperatures immediately. Unit shown guards six refrigerated boxes. Lights indicate normal and alarm conditions. Unit has alarm time delay controls, alarm reset buttons.

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(Continued from preceding page)

EXAMPLE:

Let $SP_1 = .66$

$CFM_1 = 1{,}000$

This is point "B"

$$SP_2 = SP_1 \times \frac{(CFM_2)^2}{(CFM_1)^2} = \frac{(.66)\ (CFM_2)^2}{(1000)^2}$$

By substituting 200 for $c.f.m._2$, and solving for $s.p._2$, it will be found that at 200 c.f.m. the s.p. is .026 in. Likewise at 600 c.f.m. the s.p. is .24 in.

CFM	SP
0	0
200	.026
600	.24
1000	.66
1400	1.27

With this information, an entire system resistance curve (A-B-C) can be plotted. This system resistance curve plotted over blower performance curves will show the blower speed needed for any required air delivery.

Manufacturer's blower performance curves also will show the motor horsepower required for any desired point of operation.

ADDING THE AIR CONDITIONER COIL

The needed amount of air (c.f.m.) required for proper operation of the cooling equipment, is specified by the supplier. Pressure drop, or air friction, through the coil under operating conditions (wet coil), will also be known for the desired air flow rate. The following steps should be taken to determine the necessary blower r.p.m. and horsepower requirements for the system, with the coil in place:

1. Locate the intersection point of the heating system resistance curve and desired air conditioning c.f.m.

EXAMPLE:

Assume a 3-ton coil required 1,200 c.f.m. is to be added to the furnace system. The system resistance curve crosses the 1,200 c.f.m. line at point "C."

2. From the intersection of the system resistance curve, move vertically along this line a distance equal to the wet coil air friction loss. Locate the point of the desired air conditioning delivery rate on the blower performance curve.

EXAMPLE:

Assume the wet coil has a resistance of .25 in. s.p. at an air flow rate of 1,200 c.f.m. Measure vertically up from point "C" to point "D."

3. From this point, the r.p.m. required to deliver air under these conditions can be read. Horsepower requirements can also be read from the blower performance curves.

EXAMPLE:

At point "D" it will be seen that the blower speed must be 1,060 r.p.m. and a ½-hp. motor will be required.

If the analysis shows that an excessively large motor will be required for cooling, outlets may be added to reduce the system resistance. If this is impractical, a larger blower is sometimes used to provide the required air delivery for the cooling coil. This change should be made only on the recommendation of the furnace manufacturer, as it may void approvals of the unit by the American Gas Association or Underwriters' Laboratories.

If it is necessary to change blowers in order to obtain sufficient air flow, a new system curve should be made. It is often found that the use of larger blowers will result in entirely different operating conditions. This is especially true in compact furnaces where there is restricted side wall clearances at the blower inlets, or where the air distribution at the blower outlet is restricted.

When the required air conditioning speed has been determined, the resulting temperature rise for the heating cycle can be calculated.

The formula for determining this temperature rise is:

$$\text{Temperature rise} = \frac{\text{B.t.u.h. output}}{1.1 \times \text{c.f.m.}}$$

EXAMPLE:

Using previous figures, temperature rise $= \frac{100{,}000}{1.1 \times 1200} = 76°$

If these calculations show a temperature rise less than 80°, it may be desirable to place the fan on manual operation to achieve continuous air circulation. With a modern perimeter distribution system (one where conditioned air is introduced into the room at the outside walls), this may be accomplished without annoyance to the homeowner.

It is recognized that the above procedures may seem to condone short cuts, which many engineers would question.

However, this analysis is primarily directed to the equipment installer. By using this simplified procedure, it is possible to obtain the following information before an add-on air conditioning job is started:

1. The motor size required for cooling.
2. Blower speed required, also pulley combination.
3. Resulting temperature rise for heating.

This information will enable the installer to make a better comfort conditioning installation.

Alco Promotes Calvin

ST. LOUIS—Alco Valve Co. has announced the promotion of William A. Calvin to chief buyer. He has assumed the responsibility of all purchasing operations, the firm said.

Chart Suggests 7 Basic Packing Types For 95% of All Needs

PASSAIC, N. J. — A chart prepared by the Packing Div., Raybestos-Manhattan, Inc. here, shows maintenance and engineering personnel the recommended packing types for specific applications.

"This new chart, on stiff paper stock suitable for posting on the wall, suggests seven basic packing types for 95% of all packing needs, including such applications as: pumps and valves, high temperature valve stem and expansion joints, high-speed rotary air compressors, corrosive and viscous liquids, chemicals, gasket applications, and hydraulic and pneumatic equipment," it was stated.

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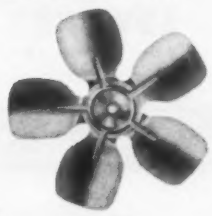

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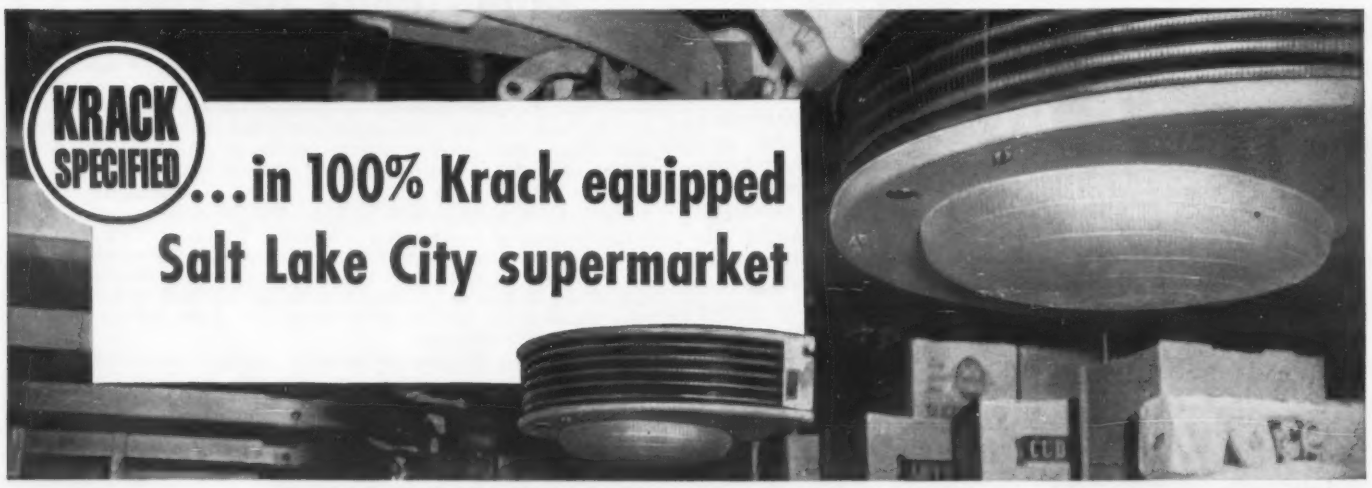

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This Is 'Shoddy' Workmanship

What Happens When Installers Don't Know Air Conditioning

● There has been considerable talk about "shoddy" workmanship in the installation of air conditioning systems. Most of this is blamed on (1)incompetent and inexperienced installation personnel and (2) lack of knowledge on the part of the contractor or the contractor's supervisory personnel to recognize that mistakes were being made.

However, for the most part, there have been few specific examples offered of the exact kind of mistakes that have been made in such installations. Recently, the editors received a report which did document the mistakes made in an installation of a system between the 50 and 100 tons' capacity range. The man from whom the report was received has been a respected figure in the industry for more than 25 years, and he had no direct connection with the particular job. He guarantees the authenticity of the following information, but requested that his name not be used:

"This relates to conditions revealed on inspection of a ( ) ton air conditioning installation, the original installation being done by a plumbing contractor. The contractor was furnished with detailed drawings covering piping and wiring.

"The piping was installed by the fitter in the employ of the contractor where the fitter was not familiar with air conditioning practice and obviously was not competent at silver brazing. Contractor lacked knowledge to detect shortcomings of the fitter and to correct irregularities during installation.

"Contractor selected electrical subcontractor strictly on bid basis. Electrical subcontractor quite apparently was incompetent in control wiring and air conditioning contractor lacked the knowledge to recognize the fact.

"For the start-up of the system, a refrigeration man was called in who lacked experience and several hundred pounds of refrigerant was placed in the system only to leak out.

"Finally, it was necessary to get on the job a competent fitter, an experienced air conditioning mechanic, and a high caliber electrician. If the owner had not held the greater portion of his fee, it is to be wondered if this system would have ever been placed in operation for the coming season."

Errors on Part of Pipefitter Not Recognized or Corrected by Air Conditioning Contractor

1. Piping connections to liquid receiver were connected in reverse. Outlet line was connected in inlet, etc.

Situation was corrected at time of visit by improvised means of adding undersized dip tube at outline connection. However, only workmanlike remedy is to disconnect receiver, turn receiver around and reconnect as intended.

2. So many silver brazed joints and one bronze brazed joint were found to be leaking that every joint in system should be leak tested and repaired as required to make gas tight. This must include removal of insulation and testing and repair as required on suction line joints.

3. Both liquid line solenoid valves have been permanently damaged by heat from silver brazing without removal of internal parts that they must be replaced with new valves. Further, it is recommended that such valves be installed by soldering with 95-5 solder.

4. Both liquid indicators are damaged by silver brazing. Both should be replaced and installed with 95.5 solder.

5. Location of two expansion valve feeler bulbs was not inspected. Location of same should be inspected and relocated if necessary to conform to manufacturers' recommendations. These bulbs must not be located to lie on pipe joint but must contact pipe for entire length of bulb.

Errors Due to Lack of Recognition or Correction By Air Conditioning Contractor

1. Filter tracks were badly deformed, presumably during erection or shipping. These tracks must be straightened to hold filters in place without air passing between filters.

2. Filter tracks were installed by air unit manufacturer in position to be offset from slots in ends of casing through which slots filters must pass to enter unit. These ends of tracks must be cut loose and rewelded to align with slots.

3. Wrong type pressure switch is installed at compressor to control motor on evaporative condenser pump, in that switch furnished OPENS on pressure rise. Further, switch is of mercury bottle type which is unsuited for mounting on vibrating location, and lacks capillary tube connection to insure compressor pulsations not actuating switch. Replace with control which is supplied with capillary tube connection and is not of mercury bottle type.

4. Pipe size installed on receiver inlet and equalizer connections does not conform to sizes specified on piping detail plans. Recommend re-piping.

Errors on Part of Electrical Sub Contractor

1. Contacts on oil pressure failure switch were welded obviously by connecting switch improperly across line. This switch must be replaced.

2. Wiring between thermostat and two solenoid valves is improperly connected to yield no voltage on one side of valve coil.

Wiring should be corrected to achieve the following:

a. Feed to solenoid valves and thermostat circuit shall be connected to air unit fan motor so that when fan motor is stopped, solenoid valves will close.

b. If two evaporator coils in air unit are of different size, then on temperature fall, when first switch in the two-step thermostat opens, solenoid valve shall close on proper coil as directed in instructions by manufacturer of coil.

When second switch in thermostat opens on further temperature fall, second solenoid valve shall also close on remaining coil.

3. Control wiring to starter on compressor motor was improperly connected so that combination high and low pressure control on compressor effected no control of motor starter. Rewire to permit this control to operate this starter.

4. No means is provided to manually disconnect compressor motor starter except switch in door of fuse panel serving compressor wiring trough. Provide either manual pilot switch to control compressor motor starter and wired in series with existing controls, or provide line disconnect switch at trough wired between motors starter and panel. (Existing panel door switch is not an accepted disconnect means for load imposed by compressor motor).

5. Furnish and install one fused disconnect switch at compressor wiring trough and connect between trough feeders and starter serving evaporative condenser fan motor.

Furnish and install one fused disconnect switch at compressor wiring trough and connect between trough feeders and starter serving evaporative condenser pump motor.

Absence of fused switches listed here is believed to constitute Code violation.

Remove fuses from fused switches serving above two items on roof after fused switches are installed at trough, and replace fuses at roof switches with copper bar to make switches at these motors equivalent to non-fused type.

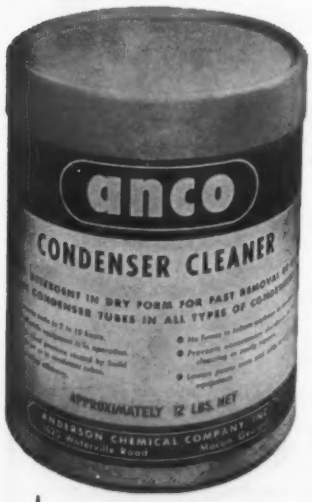
bring head pressure DOWN

keep operating efficiency UP

with anco condenser cleaner

ANCO Condenser Cleaner removes scale and rust from condensers within 2 to 15 hours, depending on scale thickness and composition. Following application, head pressure drops to normal and the condenser's efficiency is restored. Simply dissolve this dry formula in sump while system operates. It works quickly and safely and is equally effective in evaporative condensers and those with separate cooling towers.

Ask your supplier about it.



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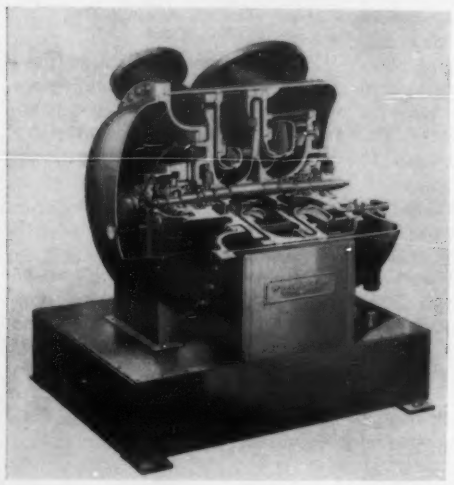
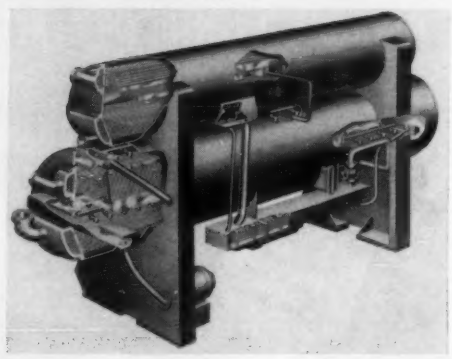
Gas Engine-Driven Compression Systems Prove More Satisfactory In Larger Sizes



CUTAWAY of a Worthington centrifugal compressor "for use with Refrigerants-11, 12, and 114, capacities from 125 to 3,500 tons."



CUTAWAY photograph of a Carrier absorption machine.

The Total Look at Gas Air Conditioning, published in the May 30 NEWS, dealt mainly with residential size units.

The term "Large tonnage" conventionally refers to systems with more than 100 tons' capacity or with more than 100-hp. prime movers. This discussion will treat briefly of such units and of the intermediate tonnage equipment, both of which differ in several respects from equipment designed for residential and small commercial application. There are gas utilities who are indifferent to the residential gas air conditioners but who are aggressive in their attempts to get large tonnage installations to "go gas."

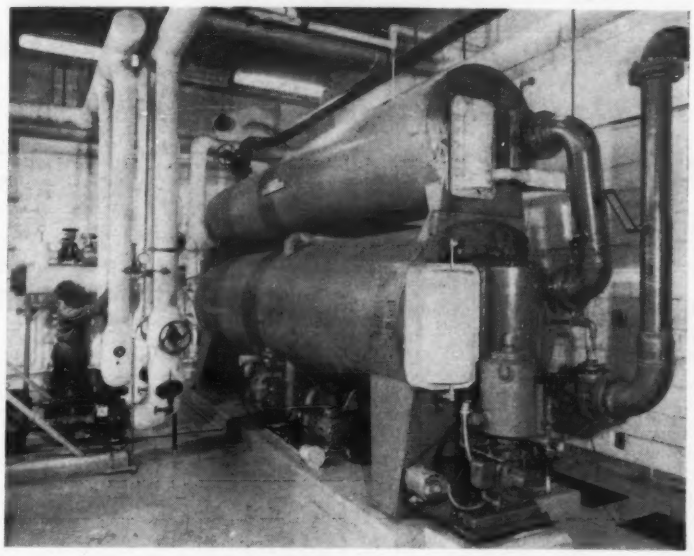
Gas engine-driven compression systems have proved more satisfactory in larger sizes than in residential units. There are two reasons for this: first, those mechanical and electrical refinements which make large equipment relatively reliable and trouble-free are far too costly for inclusion on smaller units; second, most commercial and industrial customers either have on hand, or will contract for, personnel to perform the periodic preventive maintenance needed on engine-driven equipment.

Sometimes this preventive maintenance is accomplished merely by having the gas station attendant down the street stop up every month or so to look at the ignition and lubrication systems.

Yet, a couple of owners have told the NEWS that when an engine-driven unit fails, they are not sure whether to call a refrigeration serviceman or auto mechanic. Several owners have called refrigeration servicemen only to be told that the difficulty was with the engine on which the servicemen refused to work.

Difficulties with engine-driven equipment in large commercial tonnages—to about 110 tons—have not been excessive, the NEWS found, and the problems have been both familiar and unique for refrigeration people. Some examples:

One country club attempted to use the swimming pool for engine cooling. The pool heated up. Next, a well was tried;



TYPICAL installation of a York absorption unit.

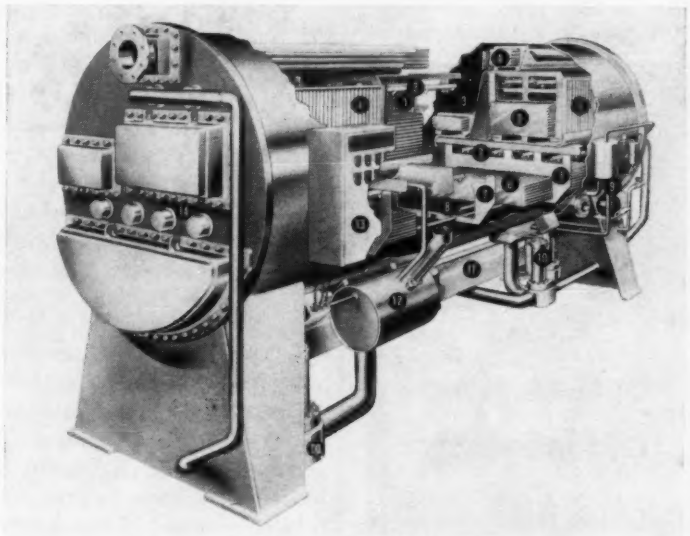


DIAGRAM and cutaway of Trane single-shell absorption system: 1) eliminators (evaporator section), 2) spray trees (evaporator and absorber sections), 3) concentrator, 4) condenser, 5) evaporator, 6) absorber, 7) tube supports, 8) internal purge piping, 9) purge unit, 10) hermetic pumps, 11) heat exchanger, 12) refrigerant sump, 13) control panel, 14) access to spray trees.

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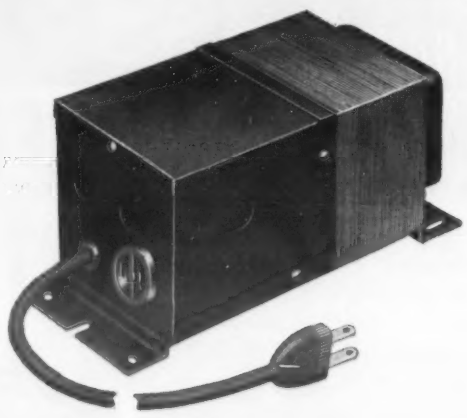
WRONG LINE VOLTAGE?

Correct it...

with an ACME ELECTRIC TAPPED WINDING TRANSFORMER



Whenever the line voltage differs from the normal voltage required by the motor driven appliance, one of these Acme Electric Tapped Winding Transformers is the simplest and most economical means of correcting the problem.

For example: If only a 240 volt single phase circuit is available and the ½ HP motor of the air conditioner or other equipment is rated for 115 volts, a type T-32564 tapped winding transformer can be plugged into the line and will provide the exact voltage required. Or, if the available circuit is 208 volts and the 3 HP motor of the refrigeration compressor is rated at 230 volts, a type T-32610 transformer will solve the voltage problem. No need to do expensive re-wiring or order special motors.

Full details about the applications for Tapped Winding Transformers are contained in Bulletin 162. Write for your copy.

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FREE PARKING AND FAST COUNTER SERVICE AT THESE 4 BIG WAREHOUSES

erratic behavior. Now a 50-ton cooing tower seems to have licked problems with water.

The modulating control which, when operating, offers one of the distinctive advantages of engine-driven air conditioning, is necessarily rather complex. "It fails far too often," complained one source. "We need simpler, not more complex controls."

Noise is a common complaint against engine-driven equipment, in spite of all attempts to reduce the sound level of the units.

On one installation, heat from the engine exhaust burned pipe and ductwork. "The exhaust and/or ducts should be constructed of or coated with heat resistance materials," suggests one installer.

There have been a few complaints of the engine's not having enough power when full air conditioning load is applied.

Reciprocating compressors, driven either by gas engines or electric motors, are normally applied to installations up to 125 hp. or so. Compression systems above that normally use centrifugal compressors, either hermetic or open. While a few custom installations have been made using a gas engine-driven gear drive on a centrifugal compressor, the more conventional application of gas to these systems is by way of steam turbines.

Steam turbine-driven centrifugals are normally applied where high-pressure steam is available and where the load exceeds 500 tons. Under these conditions, steam turbines show operating economies even over absorption equipment, most authorities agree. Thus, an industrial engineer in Atlanta, cites data which shows that the cost of operating the steam turbine to drive a centrifugal air conditioning compressor averages 5 mills per ton-hour, at the going utility rate, compared to an average of over 13 mills per ton-hour when an equivalent electric motor is used. "If only low pressure steam is available, low maintenance operation may be obtained using an absorption system."

Centrifugal compressor speeds vary from about 3,000 r.p.m. in the larger machines to about 12,000 r.p.m. in the smaller. Gas consumption when the compressor is steam turbine-driven is near 15 cu. ft. per ton-hour; this drops to 10 cu. ft. when exhaust steam from the turbine is used in a supplemental absorption unit.

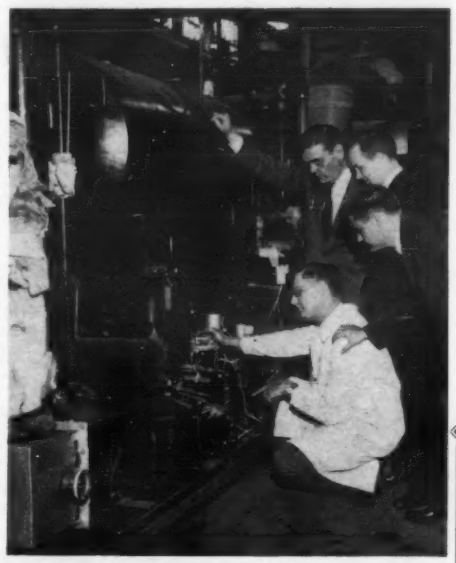
Carrier, York, and Trane are presently the only suppliers of large tonnage absorption equipment, having entered the field in the order mentioned. All water-lithium bromide systems, the units differ in mechanical details. Trane, the newest, has enclosed the entire absorption cycle in a hermetic single shell; the company's units are just now reaching the field.

Carrier units are available in from 80 to 700-ton capacities; York supplies equipment from 100-740 tons, and Trane offers units from 100 to 350 tons. These are nominal figures; unit capacity can vary with design conditions.

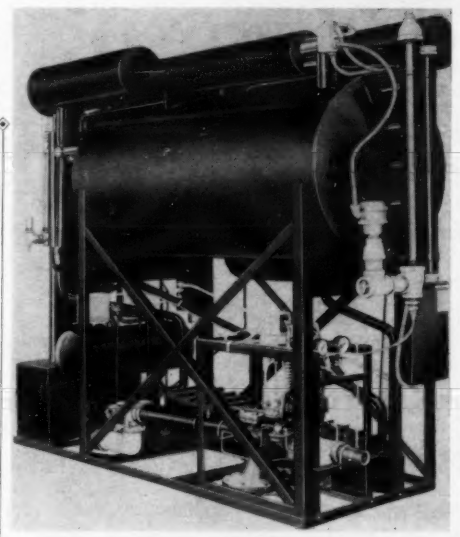
Theoretically, because of the great reduction in the number of moving parts, a large absorption system should be relatively easy to maintain and operate. In practice, of course, problems peculiar to the systems do develop. In discussion with NEWS editors, several operating engineers pointed out:

Solution pumps go bad fre-

(Continued on next page)



NEW ARKLA 25-TON gas absorption chiller - heater undergoes testing by major development engineer Fred Bawel. Looking on, left to right, are Arkla Vice President and Manufacturing Manager Les Walbridge; Paul Williams, midwestern regional sales manager; and W. G. Wepfer (hand on Bawel's shoulder), general sales manager.



ARKLA-SERVEL 25-ton absorption Series 3000 (steam-operated) water chiller.

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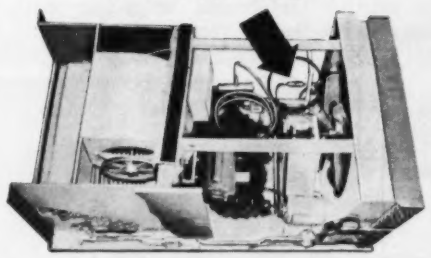

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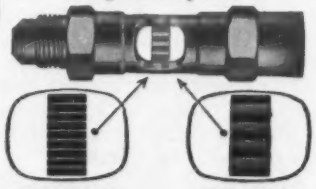

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Large Gas Air Conditioning--

(Continued from preceding page)
quently—frequently when compared to other liquid pumps. Crystallization takes place unexpectedly and in locations other than those warned of by manufacturers. For example, one manufacturer suggests that crystallization may occur in the heat exchanger on its unit. The engineer finds that the crystallization occurs repeatedly in the line to the heat exchanger.

While some absorption units are designed to free themselves should crystallization occur, it is common practice to help the process along by playing steam on the outside of the unit.

On one make, trouble has been encountered with the purge pump and its connecting valve to the system. Apparently, under some conditions, the pump can fail without the valve's closing off. Air gets into the system (which is normally under vacuum) since the pump is in ambient.

Leaks in hard-to-locate places consume many hours in the finding. Usual practice is to break the vacuum with nitrogen, charge some halogenated refrigerant for a tracer gas, and use a halide leak detector.

Just as some operators complained about the complexity of the modulating control on gas engines, there are those who complain about the complex electronic steam input controls which "have proved more troublesome than they are worth," according to one disgruntled operator. He replaced his electronic system with a "much simpler and much less expensive pneumatic system. More reliable, too," he insists.

Arkla, which may begin to fill the gap between its present units and the big tonnage equipment, presently offers a 25-ton absorption chiller—either steam operated or direct fired. Sales so far have been in the "hundreds" according to one company spokesman.

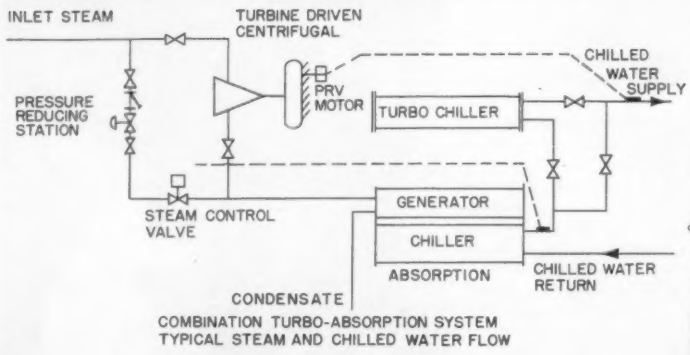
Industry sources estimate that large tonnage absorption systems will go into 500 installations this year, 80% of these in tonnages under 500. Hoping that over half of these systems will use gas as the fuel, gas people are anticipating a consumption of over 4 billion cu. ft. of gas from these units alone.

Temperature, Humidity Controlled In Paper Lab

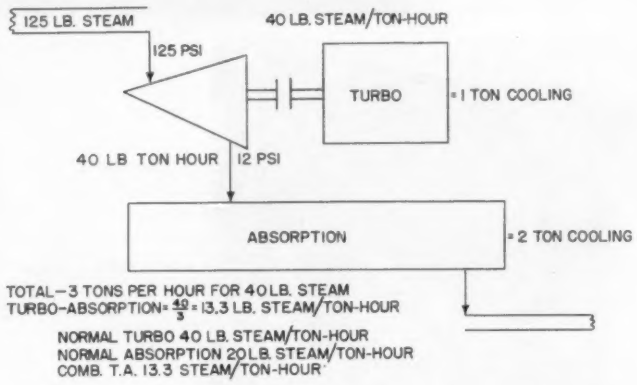
ALBANY, Ore. — Controlled humidity and temperature test rooms are included in the $100,000 laboratory recently completed here for Western Kraft Corp.

The new facility is designed to test and develop new and improved packaging as well as pulping and papermaking processes. The most rigorous storage and shipping conditions to which containers may be subjected can be duplicated in the test rooms, according to C. R. Duffie, vice president.

Combination Turbo-Absorption System



ABOVE—THE FLOW DIAGRAM of the combination York turbo-absorption system at the Boston Statler-Hilton and (below) a diagrammatic representation of the relative steam consumptions of the two systems.



Gives Boston Hotel Better Than Expected Economy of Operation

BOSTON — Forced by space limitations to install a combination turbo-absorption air conditioning system, the Statler-Hilton hotel here has realized more than the expected economy of operation.

Using a noncondensing steam turbine centrifugal, which normally consumes 40 lbs. of steam per ton-hour, and an absorption system, which normally requires 20 lbs. of steam per ton-hour, the hotel has a system which is producing three ton-hours of cooling while consuming 40 lbs. of steam—for a consumption rate of 13.3 lbs. of steam per ton-hour.

Using York equipment, the installation consists of a 238-ton turbo unit and a 574-ton absorption unit. The chilled water range is 53.3° to 42° F.

According to York engineers who studied the installation, the consumption of steam decreases at a greater rate than expected when the load on the system drops, with "the net result that the partial load steam rate is even better than the full load steam rate, all the way down to 50% load."

154-Unit Apartment House Is First In Manhattan with Absorption Chiller

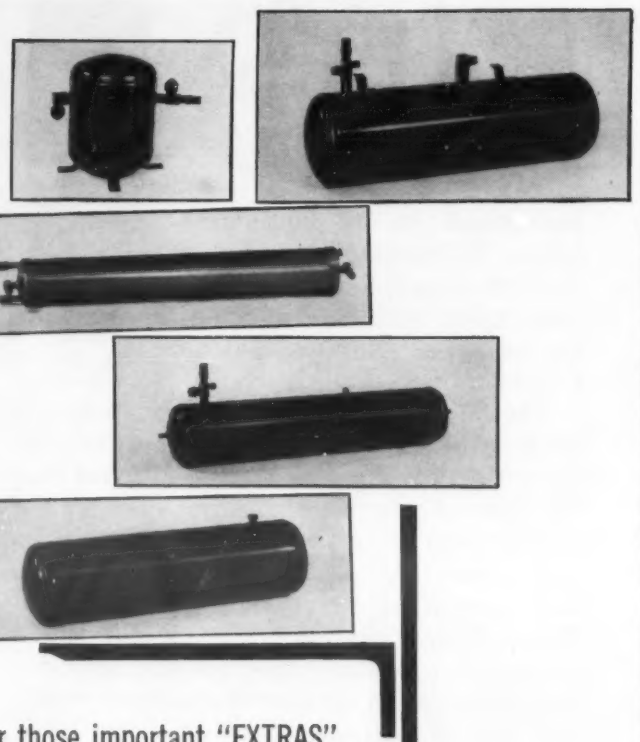
NEW YORK CITY—A 250-ton Carrier absorption chiller has been installed in the new 19-story Wedgewood House at Fifth Ave. and 14th St. here. The 154-apartment structure is termed "one of the largest new residential buildings to use central air conditioning and the first apartment house in Manhattan to use absorption equipment in this manner," by Carrier.

According to Alexander Hirsch, partner of the building firm, Denberg & Hirsch, "the difference in cost between central air conditioning and room units is not appreciable. In fact, we saved $6,000 on wiring based on New York's new code for a central system, in addition to savings on lathing and plastering."

Chilled water from the Carrier absorption unit and warm water heated by steam from Consolidated Edison mains will be circulated to 325 fan-coil Weathermaker units. The under-window units will provide room-by-room control for tenants, the company said.

Oser Retires

RICHMOND, Va. — Abe E. Oser, a veteran of nearly four decades in the credit management field in North Carolina, has retired as district credit manager for the Noland Co., Inc. He has been associated with credit management work among North Carolina plumbing and heating contractors since the early 1920's.



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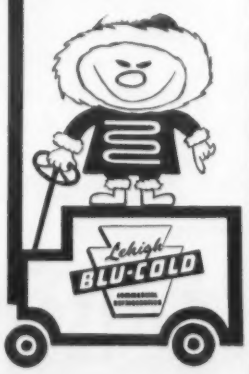

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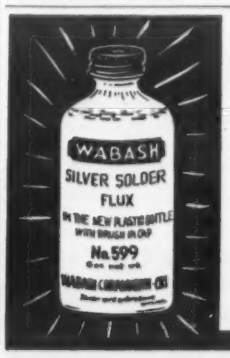

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NEW UNBREAKABLE PLASTIC BOTTLE—"Conolene" six-ounce bottle comes complete with brush-in-cap for easy application. Wabash Silver Solder Flux provides increased capillary action for faster, easier, and more satisfactory results. Less fumes, glare, and irritation to the skin. Other sizes available . . . write for prices.

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Air Conditioning Sales Roundup--

(Continued from Page 1, Col. 5)

great as had been hoped-for by some producers, there were others who felt it was in line as a conservative increase over a good year (1959).

Sales in May by manufacturers of unitary equipment showed a slightly better increase than the average for the five months, which was encouraging in view of the production slowdowns in other consumer durable goods fields.

Split Systems, Heat Pumps Doing Best at Retail

Principal gainers in terms of types of unitary air conditioners were split systems and self-contained heat pumps, both of which apparently increased well above the average for all unitary systems. Split-system heat pumps, however, showed gains slightly under the average.

Self-contained air conditioners gained at about half the rate of the average gain, while year-round air conditioning systems showed a degrease from last years' five-month figures.

Mfrs. Room Unit Sales Zoomed Through May

In room air conditioners, estimates just released by the National Electrical Manufacturers Association (NEMA) statistical department put the total sales by manufacturers for the first five months at 888,200 units, with May sales placed at 244,600 units. This represents a reasonably good increase over last year, and May is up somewhat over May, 1959, although the May, 1960 figure is "just about an average May" over a period of years, according to one observer.

Possibly more important is the unofficial estimate of the sale by manufacturers of 1,340,000 units since the start of the "air conditioning year" (Sept. 1, 1959) to date as compared with a figure of around 970,000 units for the similar period last year. Combined manufacturer and distributor inventories at the end of May were thought to be in the general area of 600,000 units, up somewhat from last year, but not too much out of line when considered in view of the much greater increase in production.

Any kind of an "exact" picture of retail sales is difficult to get on a current basis. However, some of the major producers of unitary equipment use various methods to keep a pretty good tab on retail movement, and certain utilities get some reasonably up-to-date figures.

Unitary Model Retail Sales Gain 10-20%

Manufacturers who felt they had a reasonably good "feel" of retail movement reported gains in unitary equipment of from 10 to 20% through May, as compared with the previous year. One manufacturer on the low end (10%) reported that preliminary figures for June indicated that month would record the best figures for the year.

Retail sales seemed to be following the pattern of manufacturers' sales in terms of types of product—that is, split systems and heat pumps going best, and year-round systems and conventional packaged units trailing.

Some Southern Areas Report Big Increases

Reports from individual areas turned up some interesting figures. In the territory served by the Florida Power Co. (St. Petersburg, Clearwater, and surrounding areas) sales reported by dealers for the first five months showed a total of 687 central heat pump systems sold for residential and commercial applications, an increase of just slightly more than 100% over the similar period in 1959. Sales of 776 conventional central residential type air conditioning systems for the first five months represented an exact increase of 100% over the number sold through May, 1959.

Sales of conventional packaged air conditioners for commercial use in the Florida Power territory totaled 221 units through May, and a gain of 17% over 1959.

In Chattanooga reports by dealers to the Electric Power Board revealed heat pump sales in May better than double last May's figures, and commercial air conditioner sales up better than 50% for the month, but central residential systems of the conventional type fell to practically zero in May, whereas last May the number of such units was considerably greater than the heat pump total.

A report by the Electrical League of Cleveland reveals that distributor shipments of central residential units (which are virtually the same as retail sales) in May were one unit greater than the May, 1959 figure. However, the increase in this type of equipment for the first five months of 1959 was 20%.

Reports from the individual manufacturers gave a little more of the picture of the "geographical" pattern of the sales increases, following as usual the weather pattern. The consensus was that Florida was setting new sales records on air conditioning, and that the picture was generally good throughout the south and southwest, with reports of new distributor sales records in some Texas and Arizona cities.

In the northern tier of states, particularly in the midwest, where there have been no prolonged hot spells except for one early in May, the sales picture is considerably less rosy. However, some distributors declared that sales of unitary systems, particularly residential, continued good well into June.

"As of July 1, there were only 11 unsold residential air conditioners in the hands of all the dealers in my entire territory," asserted the regional manager of one of the industry's top producers. The region is a midwest one covering several states, and the regional manager says that sales by distributors thus far this year have set records, so that the total volume is high.

"What seems evident to me," he continued, "is that there has been more early season buying and more 'planned purchases' of air conditioning — particularly

(Continued on Back Page, Col. 4)

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Long Beach, Santa Ana, San Bernardino, Calif. & Las Vegas, Nevada.

ALLIED REFRIGERATION
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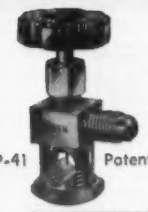
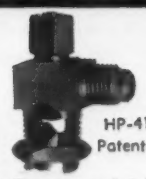


HP-41 Patented

1 Valve for 4 Tube Sizes—3/16", 1/4", 5/16", and 3/8".



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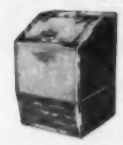
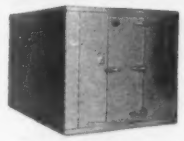
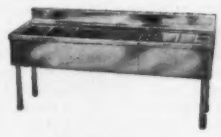


KUBE KING



WALK-IN



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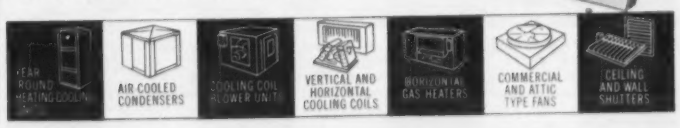
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MANUFACTURER'S REPRESENTATIVE—Tremendous acceptance of our new upright frozen food display merchandiser with exclusive "non-sweat" glass, plus demand for "Fogel" refrigerated market equipment offers opportunity for fast earning potential. Southeastern states and states west of Chicago still open. Write or wire FOGEL REFRIGERATOR COMPANY, Philadelphia 37, Pa.

SALES ENGINEER to represent air conditioning manufacturer in Pacific Northwest. Residency in Seattle preferred. Proven sales experience in heating, packaged cooling, and field assembled fields mandatory. Attractive base salary, bonus, and expenses with real future opportunity. Send brief resume to: WESTINGHOUSE ELECTRIC CORPORATION, Air Conditioning Division, 1515 So. Garfield Ave., Los Angeles 22, California.

SERVICE MANAGER-Authorized Carrier dealer seeks experienced man to supervise service activities in Albuquerque, New Mexico. Excellent opportunity and working conditions. Ideal climate. Submit resume to BOX A6576, Air Conditioning, Heating & Refrigeration News.

AN OLD national retail sales organization manufacturing their own exclusive design equipment needs an experienced commercial refrigeration salesman for New York, Pennsylvania, and New England states. No ceiling on earnings which run from $12,000.00 on up commensurate on ability and willingness to work. Give resume' of experience and earnings. All replies confidential. Our men know of this ad. Reply to BOX A6579, Air Conditioning, Heating & Refrigeration News.

EQUIPMENT WANTED

COPELAMETIC PARTS: Will buy your surplus parts on Copelametics. Need discharge and suction valve reeds, two to ten horse-power models. Give description, quantity and price. UNITED REFRIGERATION CORPORATION, 514 W. 12th St., Los Angeles 15, California.

EQUIPMENT FOR SALE

3—(USED) Trane-JN-10, (10 ton) Evaporative condensers, vertical discharge. We recently removed condensers for redesigned job—Make offer. New custom built, chest type self-contained freezers. Approximately 22 cu. ft., S.S. top and sliding glass top doors—Will close out. PIONEER REFRIGERATION CO., INC., 2867 W. Franklin St., Baltimore 23, Maryland.

WATER COOLERS, electric. Manufacturer's closeout due to model change. Bottle type with refrigerated, stainless steel storage compartment. Tecumseh ⅛ h.p. hermetic unit, fan condenser. Attractive, sturdy. Complete with five-year warranty on hermetically sealed refrigeration circuit. $118.00 each. REMCOR PRODUCTS COMPANY, 321 E. Grand Avenue, Chicago 11, Illinois.

ATTENTION REFRIGERATION Servicemen: Send for catalog listing values in refrigeration and air conditioning parts, relays, capacitors, compressors. Savings up to 50%. WALTER W. STARR, 2833 Lincoln Ave., Chicago 13, Illinois.

BUSINESS OPPORTUNITIES

HUSSMANN REFRIGERATOR distributorship for sale . . . Tampa, Florida and 13 counties fastest growing West Coast. Going business. Bookkeeper, salesmen, installer will stay. Sell cash, or minimum down, 3 year payout. Immediate action necessary, owners health. Write KARL S. FANTLE, Box 402, Tampa, Fla. Phone 20026 or evenings—64-9401.

DISTRIBUTORS WANTED: Manufacturer of refrigerated, self-service milk and dairy products cabinets especially designed for school, institutional, and super market use wants additional distributors. Prefer distributors now contacting schools, dairies, restaurants, super markets and similar customers. Choice territories available. DISPLAY-O-MATIC, INC., P. O. Box 338, Bradenton, Florida.

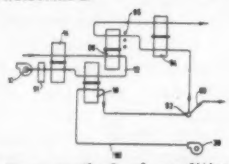
PALM SPRINGS, California — Air conditioning, refrigeration, appliances, sales & service business, well established in fast growing area with air conditioning a must. $12,500.00 includes truck and inventory. BOX A6578, Air Conditioning, Heating & Refrigeration News.

FLORIDA OPPORTUNITY—Air conditioning distributorship and contracting business. Nationally known brands. Fully equipped sheet metal shop. 3 trucks. 1959 volume $102,000.00, estimated 1960—$200,000.00. 45% interest—$15,000.00, or sell all for $25,000.00. Fastest growing area. Management will stay if desired. BOX A6578, Air Conditioning, Heating & Refrigeration News.

PATENTS

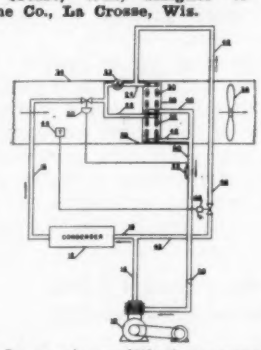
Week of March 1

2,926,502. AIR CONDITIONING SYSTEM. Carl Georg Munters, Stocksund, and Per Gunnar Norback, Lidingo, Sweden, assignors to Lizenzia A.G., Zug, Switzerland, a corporation of Switzerland.



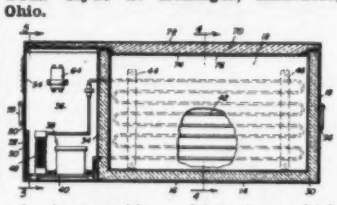
8. In a method of conditioning air causing said air to flow successively through a plurality of stations, said air at one station being treated by passing it through an air permeable solid sorbent material to attain a psychrometric condition of a lower moisture content. . . .

2,926,503. REFRIGERATION SYSTEM CONTROL. Emil T. Neubauer, La Crosse, Wis., assignor to The Trane Co., La Crosse, Wis.



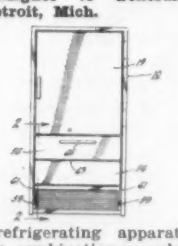
1. In an air conditioning apparatus, the combination of air circulating means and a refrigeration system to condition the air circulated by said air circulating means, said refrigeration system comprising a compressor, a condenser connected to said compressor, expansion means connected to the downstream side of said condenser, heat exchange means located transverse to the air flow created by said air circulating means, conduit means connecting said heat exchange means to said expansion means, a suction line connecting said heat exchange means and said compressor. . . .

2,926,504. PORTABLE REFRIGERATOR. Clyde B. Hellinger, Mansfield, Ohio.



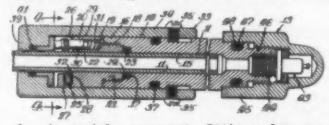
1. A portable refrigerator which comprises a housing that has end walls, side walls, and a bottom wall, a casing which encloses a compartment, said casing being smaller than said housing and located within said housing, insulation between the walls of said casing and the walls of said housing to insulate said compartment, a partition in said housing having a surface against which the insulation abuts and separating the housing into a refrigeration unit compartment and a food and beverage compartment, a refrigeration unit mounted in part in said refrigeration unit compartment and having an evaporator in said food and beverage compartment. . . .

2,926,507. REFRIGERATING APPARATUS. Anthony J. Ingolia, Detroit, Mich., assignor to General Motors Corp., Detroit, Mich.



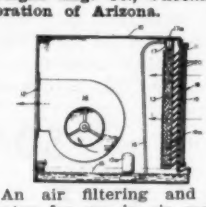
4. A refrigerating apparatus comprising in combination, a cabinet having walls forming an open front food compartment therein, a refrigerating system associated with said cabinet including a refrigerant evaporator for cooling foods in said compartment, a shiftable sectional closure means normally closing the open front of said compartment, said closure means including a top door and a bottom door, the lower portion of said bottom door being pivotally mounted upon walls of said cabinet and having its upper portion hingedly attached to the lower portion of said top door, lever arms movably linking said top door to said cabinet. . . .

2,926,700. QUICK CONNECT FITTING. George E. Franck, Riverside, Ill., assignor to The Imperial Brass Mfg. Co., a corporation of Illinois.



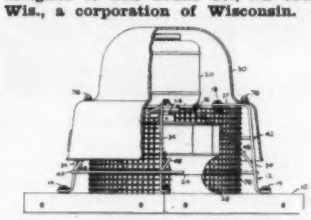
1. A quick connect fitting for use with straight-ended tubes, comprising: a body having a bore therethrough adapted to receive the end of a tube; a control member having a first portion limitedly slidable on the body parallel to said bore and a second portion spaced from the body adjacent one end of the bore; a locking ring coaxial of the bore and disposed between said body and said transverse portion, the internal diameter of the ring being slightly larger than the outer diameter of the tube. . . .

2,926,747. AIR FILTERING AND PURIFYING APPARATUS FOR AIR COOLERS. Jay L. Wright and Lewis N. Tenney, Phoenix, Ariz., assignors to Wright Mfg. Co., Phoenix, Ariz, a corporation of Arizona.



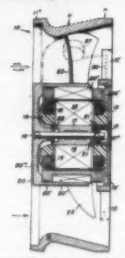
1. An air filtering and purifying apparatus for use in air coolers comprising an evaporating pad vertically disposed in the path of air flow, means for depositing a fluid coolant above said pad and allowing said coolant to be passed downwardly therethrough, means providing a plurality of vertically inclined louver surfaces having lower edges in close-lying relation to said pad, said surfaces extending upwardly and outwardly therefrom, and a flow screen vertically disposed in the path of air flow on the outer side of said louver means and closely adjacent said louver means, said flow screen containing a highly adsorbent and purifying material. . . .

2,926,837. POWER ROOF VENTILATOR. Robert B. Coe, La Crosse, Wis., assignor to The Trane Co., La Crosse, Wis., a corporation of Wisconsin.



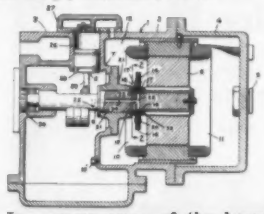
1. A power roof ventilator comprising a base adapted to be mounted on a roof over a roof opening, said base having an orifice for the passage of air, upright wire leg members secured to said base and being angularly spaced about the orifice to said base, horizontal annular wire members welded to said upright wire leg members at spaced intervals along said upright wire leg members. . . .

2,926,838. VENTILATING MOTOR AND FAN. Jacobus Constant Van Rijn, Woodstock, N. Y.



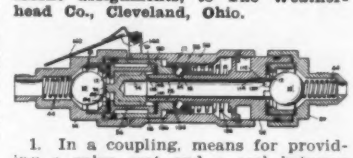
1. A ventilating fan assemblage comprising a mounting ring of limited axial extent, at least one spoke-like support at one end of said mounting ring extending generally radially inwardly thereof and lying within the axial length of said mounting ring, at one axial end of said mounting ring, an electric motor end plate mounted on said spoke-like support centrally of said mounting ring, a stator element secured to said end plate and of a length to lie entirely within the axial length of said mounting ring. . . .

2,926,840. ENCLOSED MOTOR-COMPRESSOR UNIT. Henri Soumeral, Springfield, Mass., assignor to Worthington Corp., Harrison, N. J.



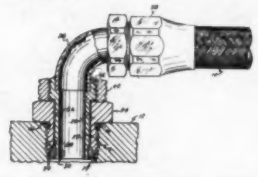
1. In a compressor of the hermetic type including a casing, partition means for dividing the casing into a driving compartment and a compression compartment, compression means in said compression compartment and driving means in the driving compartment, shaft means in the casing operatively interconnecting said compression means to said driving means, said driving means dividing the driving compartment into a first zone adjacent the compression compartment and a second zone. . . .

2,926,934. COUPLING. Vincent A. Gill, Montclair, N. J., assignor, by mesne assignments, to The Weatherhead Co., Cleveland, Ohio.



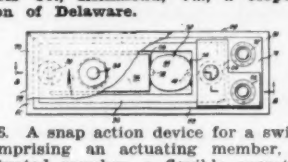
1. In a coupling, means for providing a valve seat and a seal between adjacent metal members supporting the valve seat, said means comprising a flexible, deformable plastic element formed with a portion for mating engagement with a valve, said plastic element having a second portion pressed between said metal supporting members. . . .

2,926,935. ADJUSTABLE BOSS FITTING. Roger B. La Marre, Jackson, Mich., assignor to Aeroquip Corp., Jackson, Mich.



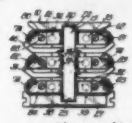
1. A boss fitting elbow assembly adapted to be affixed within a threaded hole of a supporting member comprising a tubular adapter having an externally threaded end portion for connecting with the hole of the supporting member, a wrench engageable head formed on the other end of said adapter having an inner bearing surface for engagement with the supporting member and an annular sealing ring adapted to be compressed between a portion of said surface and the supporting member. . . .

2,927,171. SNAP ACTING SWITCH. William E. Rhodes, Columbus, Ohio, assignor to Robertshaw-Fulton Controls Co., Richmond, Va., a corporation of Delaware.



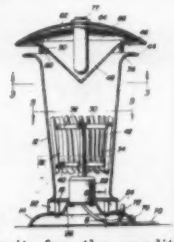
6. A snap action device for a switch comprising an actuating member, an actuated member, a flexible operating spring having a semi-circular portion operably disposed between said members and mounting end portions, abutment means operatively interconnecting each mounting end portion with adjacent ends of said actuating and actuated members whereby movement of actuating member causes said spring to move with a rolling action....

2,927,180. MAGNETIC SWITCH ASSEMBLY. William C. Furnas, Batavia, Ill., assignor to Furnas Electric Co., Batavia, Ill.



1. In a magnetic switch assembly, the combination with a magnet coil having an armature, of a contact block having a movable contact member connected to the armature and adapted to be reciprocated with respect to the block, a plurality of supporting partitions provided by the contact block each providing a flat rear surface substantially vertically disposed and a side diagonal surface....

2,927,188. AIR CONDITIONING UNIT. George W. Green, Toronto, Ont., Can.



1. A unit for the conditioning of air, said unit comprising a casing, a blower mounted in said casing, said casing having a base at its lower end, said casing and base spaced from each other to provide an air inlet for the blower, said casing having an air discharge opening at its upper end through which the air propelled by the blower is adapted to pass, means for adjusting said air discharge outlet. . . .

AFDOUS Frozen Food Code (3)

NARW Session Summarizes Arguments for and Against Its Adoption As Law by States, Tells Why Industry Is Disturbed

MIAMI BEACH, Fla. — An excellent summarization of arguments for and against the controversial frozen foods handling code drafted by the Association of Food and Drug Officials of the United States was presented at the annual convention of the National Association of Refrigerated Warehouses here.

The summarization was made in question and answer form at a session moderated by Paul D. Burrill of Quincy Market Cold Storage & Warehouse Co., Boston.

In the first instalment of this three-part article, Burrill explained what AFDOUS is and how the code came about. He explained the 0° F. requirement and presented arguments as to why it was not practical.

In the second instalment, he outlined the attitudes of NARW and other associations of frozen food handlers toward the code.

The questions and answers continue:

●

Q.—What states now have laws and regulations governing frozen foods?

A.—Florida and Massachusetts. Connecticut, I believe, has enabling legislation but has not made regulations.

●

Q.—What in general does the Florida regulation provide and when was it effective?

A.—For storage at 0° F. in warehouses, distributors, and retail stores but receipts may be accepted up to and including 20° F. Briefly, they are allowing a 20° F. tolerance for transportation. It was effective May 20, 1959.

●

Q.—What about the Massachusetts regulations?

A.—It is quite a voluminous regulation 24 pages and it covers production right through to the retail cabinet with sections for processors, food service establishments, warehousing, transportation, distributors, and retail as well as 5½ pages of definitions.

0° F. is specified pretty well throughout except that those people operating freezer space may accept product up to 10° F. It is effective Aug. 1, 1960.

●

Q.—Is there legislation on the books or pending in other states?

A.—I do not believe that there are any laws based on the code in other states. A bill was introduced in New York State and through the efforts of the New York State Association with the cooperation of our State AFDOUS committee the bill was withdrawn.

I understand Tennessee, Connecticut, and probably Illinois plan hearings this year. Our good friend Horace Wilson is fighting a proposed law in Pennsylvania.

●

Q.—Has there been any action by groups or associations to attempt to get AFDOUS to forget about the code, to modify it, or postpone it?

A.—Our industry position has been made clear to AFDOUS in writing. The packers and distributors have made their positions clear to AFDOUS by resolutions adopted by those associations.

This association also attempted to get the Massachusetts regulations repealed or postponed by appealing to Governor Furcolo and meeting with legislators and Deputy Commissioner Michaels, who prepared and held the hearings on the Massachusetts Code. At every recent convention AFDOUS has been a topic and opposition expressed against it.

●

Q.—What has been the reaction of the AFDOUS people to this and other protests?

A.—They have politely listened and asked those protesting to make specific suggestions for point by point revision of the code. So far, they seem adamant on keeping the code and seem as an association not to wish to pry into the State affairs.

●

Q.—What will be our future action?

A.—Believing that quality maintenance will be better accomplished by voluntary industry action than by government regulations, we will work on our own standards. In the event we are forced to oppose the enactment of unrealistic and arbitrary regulations based on the AFDOUS Code, we would use the warehousing section which NARW has rewritten to see that our industry was not unduly penalized.

We want to be sure, too, that we are not policemen of the code. Also, we will work with other recognized trade associations to present a united front on frozen food handling practices.

●

Q.—Do you think that eventually we will have laws or regulations governing frozen foods in the various states?

A.—Personally, I do. The regulatory officials, all aware of damage done to frozen foods by mishandling, the necessity for 0° F. to preserve quality and all, have copies of the present code.

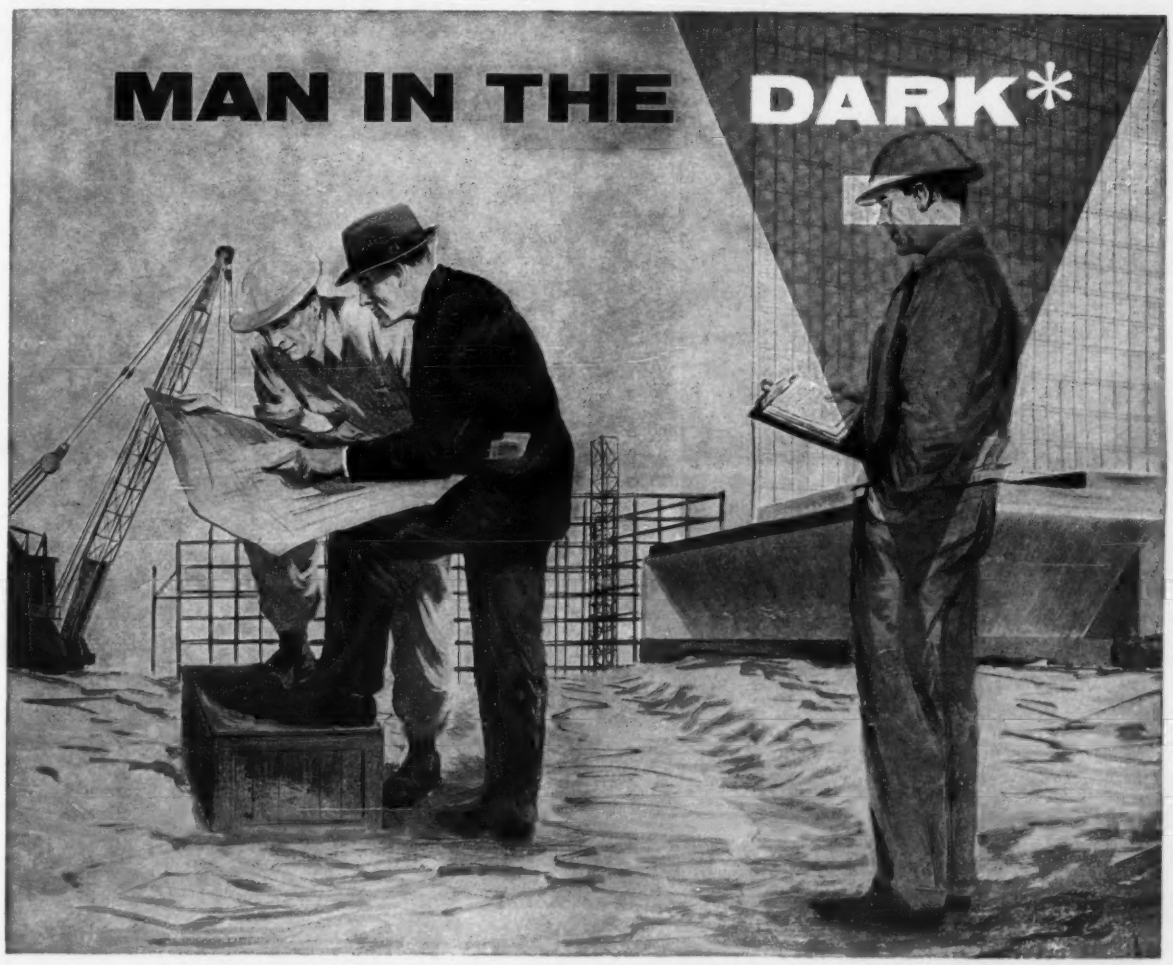
Q.—What should we as warehousemen do in our own plants to get ready for a situation such as this?

A.—Various people will probably do different things. We in Quincy Market over the past year and a half have reviewed our plants.

We have beefed up engine rooms where there has been any question of capacity under extreme conditions, have added pipe to areas that have been marginal, and lowered temperatures in freezing rooms.

We have assigned and trained men at each location to take and record temperatures on all incoming and outgoing freight. I would suggest consideration of a similar review of the problem by all.

NEWS readers are invited to write to the editor giving their opinions on any subject of interest to the industry.



*"They knew about it . . . why didn't I?"

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NLRB Orders Halt to Boycott Against Burt Mfg. In Jurisdictional Row

WASHINGTON, D. C. — The National Labor Relations Board has ordered the Sheet Metal Workers' International Association and three of its locals to halt boycott activities which allegedly have been going on for several years against Burt Mfg. Co., Akron, Ohio manufacturer of ventilating equipment.

In addition, the NLRB ordered the international and the three locals—70 of Akron, 65 of Cleveland, and 98 of Columbus—to stop trying to cause Burt to sign a union shop contract with the Sheet Metal Workers unless Burt employes first vote to be represented by that union.

The case involves a long-standing jurisdictional dispute between the Sheet Metal Workers and the United Steel Workers, which has represented Burt workers since 1945.

In a unanimous decision, the NLRB ruled that the international and the Akron and Cleveland locals had induced and encouraged employes of sheet metal contractors to refuse to install Burt products.

According to the labor board, this was in accord with the international's policy of blocking installations of Burt sheet metal equipment, with an object of "forcing or requiring other employers and persons to cease using or handling Burt products and to cease doing business with Burt."

The NLRB also ruled that the international and all three locals had illegally urged employer-contractors, by refusing to handle Burt products, to force the company to give the Sheet Metal Workers a union shop in place of the Steelworkers.

Unfair labor practice charges were filed by Burt against the Sheet Metal Workers in 1957. Burt claimed that the jurisdictional dispute had cost it millions of dollars in lost business.

Hearings on the complaint were held in Cleveland in April and May of 1958. In February of 1959, NLRB Trial Examiner William F. Scharnikow, in his intermediate report, recommended that the Board order the Sheet Metal Workers to halt the boycott.

Both unions are AFL-CIO affiliates. In 1958, the AFL-CIO directed the Sheet Metal Workers to cease any actions designed to impair the collective bargaining relationship between Burt and the Steelworkers.

Air Conditioning--

(Continued from Page 41, Col. 5)

central residential systems—by far this year than in any previous year."

Another midwestern distributor reported that his firm had done 98% of its sales quota by the end of June, even though it has four more months to go on the fiscal year.

In room air conditioners the sales picture was very spotty, with the situation affected more seriously by the continued cool weather in most of the northern metropolitan centers than was the case of the unitary equipment. Again, there was some cushion provided by early season buying to pick up "no-excise-tax bargains" and apparently also by more planned purchases.

One leading manufacturer of room units reported that for the period from the first of the year well into June its sales in the east and midwest had been satisfactory, with its largest distributor already having sold more units by the end of June that it had for an entire year in any other year, and warranty cards indicating retail sales as good as any previous year.

Reports on distributor sales of room air conditioners to the Electrical Association of Philadelphia revealed that the 9,511 units sold in May were more than double that of any other appliance except TV sets, and the figure topped the TV set total by a good margin. The figure compared with 8,301 units for May, 1959. For the year, thus far, distributor sales in Philadelphia are up 31%.

In St. Louis, however, May distributor sales were 57.6% behind the May, 1959 figure, and for the five months distributor shipments are down 27.2%.

N. Y. Strike--

(Continued from Page 1, Col. 5)

cludes large commercial and industrial work plus large home building projects where union sheet metal men are employed.

Not affected will be small commercial jobs involving only a few packaged units and single home jobs normally handled by non-union installation crews, according to one large contractor.

According to a spokesman for the Building Trades Employers Association, which is negotiating for employes, the strike could halt $1 billion worth of current construction. In addition to the 10,000 union men directly involved in the walkout, it will affect 140,000 other building trade workers as shortages develop.

Although other building trades unions have accepted three-year pacts, the steamfitters are seeking an unprecedented single year contract, along with increases in wages and fringe benefits. Employers are offering more modest increases spread over three years.

A large air conditioning contractor indicated to the NEWS that the strike could easily last a month. He believes that union workers are likely to take off on two-week vacations during which no real effort will be made to settle the strike. After they return it may take another two weeks to reach an agreement.

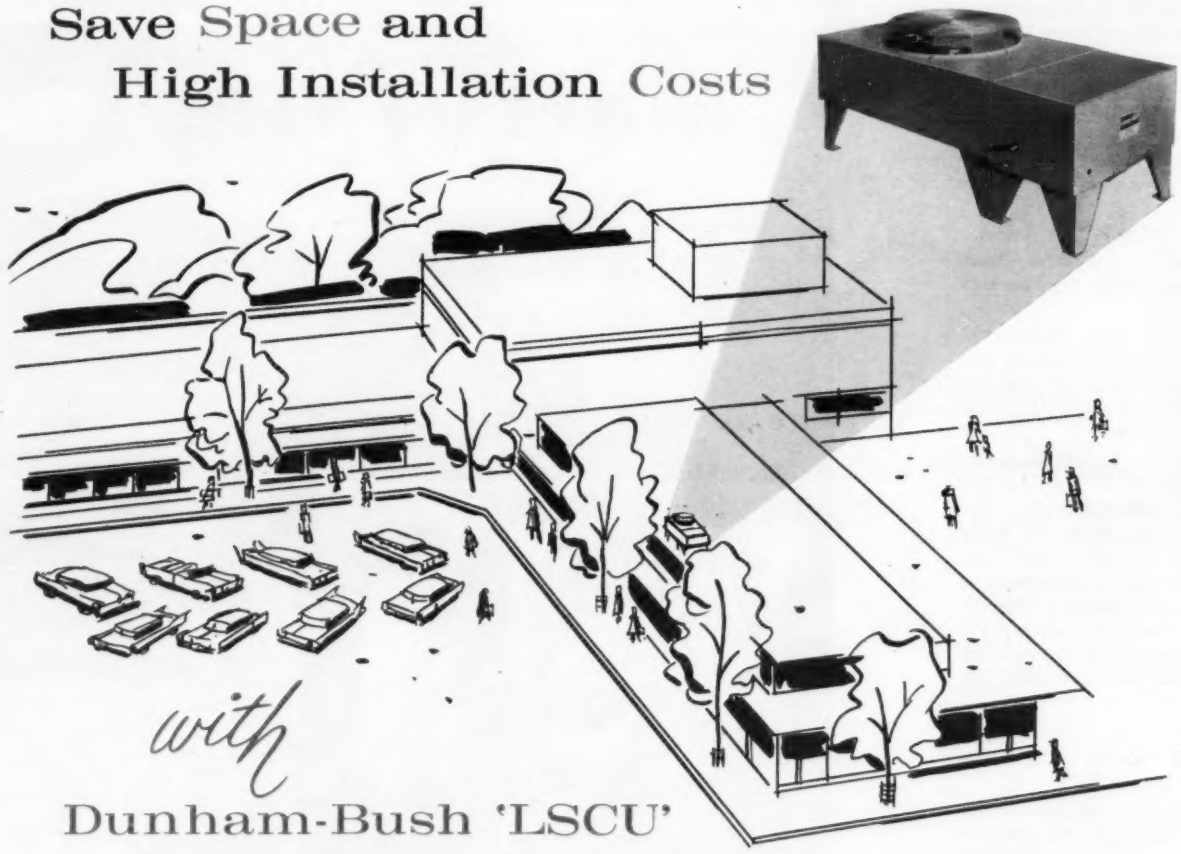
Political pressures brought against both unions and employers—the building industry is important to New York City's economy—might hasten a settlement, he added.

He said work on "applied system" type air conditioning is definitely at a standstill. Work on packaged units larger than 5 hp. in both new construction and renovations will probably be halted.

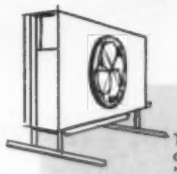
Units of 5 hp. and smaller, if going in multiple in larger buildings through a large contractor using union labor, will also probably be halted, he believes.

Involved in the strike are Steamfitters Local 638, Sheet Metal Workers International Union Local 28, and Asbestos Trades Local 12.

Save Space and
High Installation Costs

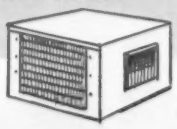


with
Dunham-Bush 'LSCU'
Low Silhouette Condensing Unit



LRCU
The "LRCU" is basically a standard "BC-P" remote air cooled condenser with a Brunner-Metic motor-compressor, Heat-X liquid receiver, electrical controls, and refrigeration accessories added. All are interconnected and installed within the casing of the "BC-P" unit. Capacities range from 10-30 tons.

RCU
Remote Condensing Unit Assemblies—These units are designed for use with remote dry expansion coils and include inner-fin condenser coils, Brunner-Metic compressors and blower fan and motor. Suction and liquid lines can be easily connected in the field.



Perplexing space problems and high installation costs, inherent in ordinary 'built up' air conditioning systems, can be eliminated by specifying the Dunham-Bush "LSCU".

These Dunham-Bush Low Silhouette Condensing Units are available in five basic sizes, 10 through 30 tons, specifically designed for air conditioning applications requiring the use of water savers. Installed with complementary Dunham-Bush "AH" Air Handling Units, they provide a complete installation.

The "LSCU" is basically a standard "LSBC" low silhouette blower condenser with a Brunner-Metic motor-compressor, Heat-X liquid receiver, electrical controls and refrigeration accessories added in a separate section for field attachment or remote installation. All motors are specifically designed for outdoor use.

"LSCU" units can be located anywhere without regard to prevailing winds. The air movement, up and out, means minimum noise rating and no objectionable air flow.

All enclosures are designed for outdoor use and constructed to permit easy accessibility for maintenance.

For more information request Form No. 7017-1.

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